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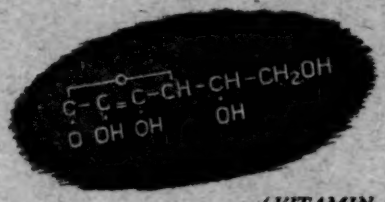

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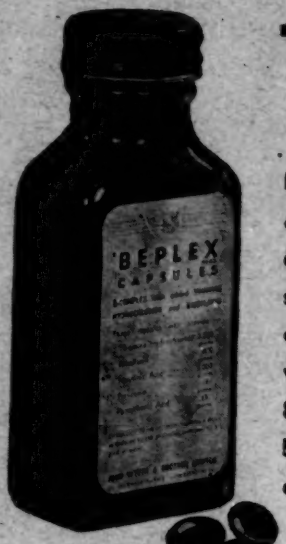

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SULPHONAMIDE RASHES

AN ANALYSIS OF 500 CASES SEEN IN NORTH AFRICA AND ITALY

BY

G. A. GRANT PETERKIN, M.B., F.R.C.P.Ed.

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Since 1937 it has been widely realized that the administration of sulphonamides by mouth is liable to cause drug rashes, particularly of a photosensitive type (Goodman and Levy, 1937; Ballenger *et al.*, 1937; Hallam, 1939), but it was not appreciated until recent times that the local application of these drugs could produce reactions as serious and lasting in their effects as those caused by oral administration. At one time I was an enthusiastic user of sulphathiazole on the skin, in the form of 5% strength in Lassar's paste or in a water-miscible cream (Peterkin and Jones, 1943). With this drug it was found that straightforward septic conditions of the skin such as impetigo contagiosa rapidly vanished. Only two or three cases of sensitization to the sulphonamide group were noted, and they had been treated with sulphanilamide powder before admission to hospital. These reactions soon yielded to soothing applications, so that sulphathiazole, used in this strength and in this form, was regarded as less liable to cause disagreeable reactions than such well-tried drugs as mercury.

In an active theatre of war, however, sulphonamides are used to a far greater extent than in military or civil life at home, and the relative proportion of individuals being treated with these drugs (for wounds, burns, and septic conditions) is very much higher. There is therefore far more risk of sensitization, and many more sulphonamide rashes tend to be observed abroad, though it is interesting to note that the incidence in North Africa and Italy seemed to be much higher than in the Middle East (Park, 1943; Tate and Klorfajn, 1944a, 1944b).

Since my arrival in North Africa in Feb., 1943, I have been compelled in no uncertain fashion to revise my original view concerning the use of these drugs as local applications. During my first 10 days in North Africa, of the 25 cases evacuated from the forward areas diagnosed as impetigo, no fewer than 15 were cases of sulphonamide-light dermatitis of a severity I had never seen in the United Kingdom. During the period spent in North Africa (Feb. to Dec., 1943) and in Italy (Jan. to Dec., 1944)—i.e., 23 months—over 650 cases of sulphonamide sensitization have been seen. Careful notes have been kept of 500 of these cases.

Under active service conditions it is difficult to obtain access to current literature, but it is believed that so far no paper has appeared describing a considerable number of sulphonamide eruptions and attempting to classify them into various groups, though the book by Bertin and Huriez (1942) must be mentioned as well as the paper by Pillsbury (1944).

Many authors have described cases of the different types of reaction due to the sulphonamides. Shaffer (1943) mentions "contact-type" dermatitis with often widespread vesicular lesions and exacerbation of the original disease, and also refers to scarlatiniform, morbilliform, urticarial, purpuric, vesicular, pemphigoid, pustular, and furunculoid eruptions, as well as rashes closely resembling erythema multiforme, erythema nodosum, and exfoliative dermatitis. Miescher (1943) notes a type composed of erythematous spots on the extremities, especially the extensor surfaces (and sometimes on the face), ranging in size from a lentil to about 2 sq. in.—not sharply defined but slightly infiltrated. The first mention of the fixed type of drug eruption (somewhat like a phenolphthalein rash) seems to have been made by Loveman and Simon (1939). Costello *et al.* (1942) noted that 21 of 196 cases treated with sulphathiazole developed skin eruptions, erythema nodosum, scarlatiniform, urticarial, and papular rashes, and angioneurotic oedema.

The photosensitization types come into a different group; they seem to be far less common in the United States than in Britain, and very few cases occurred in American soldiers serving over-seas. Despite a close liaison with three U.S. dermatologists, I saw only 5 cases in their patients, though the incidence among Canadian soldiers was as high as in British troops (Hair, personal communication). Sulphonamides were used, if anything, more freely in American patients, but sulphadiazine was more often prescribed than sulphanilamide or sulphathiazole.

Of the various drugs employed, sulphanilamide seemed the most apt to cause reactions, especially if used in the form of the powder, but sulphathiazole, sulphapyridine, sulphadiazine, and sulphaguanidine were often the agents used. The whole group were less likely to cause reactions if applied in the form of a thick paste or a water-miscible cream. In over 90% of cases the original drug which had sensitized the skin was sulphanilamide powder.

Types of Eruption seen in B.N.A.F. and C.M.F.: 500 Cases

	Cases	%
I. Sulphonamide-light	361	72·2
(*a*) Erythemato-papular	47	9·4
(*b*) Vesicular	1	0·2
(*c*) Severe—bullous, crusted, and oedematous	309	61·8
(*d*) Telangiectatic	4	0·8
II. Contact: Vesiculation, followed by weeping and superficial ulceration; maybe general eczematization	51	10·2
III. Infectious eczematoid dermatitis, following a contact dermatitis	31	6·2
IV. Disseminated neurodermatitis—maybe secondary to a patch of neurodermatitis	4	0·8
V. Generalized vesicular	4	0·8
VI. Generalized bullous (pemphigoid)	1	0·2
VII. Fixed type of drug eruption	1	0·2
VIII. Purpuric:		
(*a*) Generalized—after oral administration	1	0·2
(*b*) Contact—purpuric reaction	3	0·6
IX. Morbilliform: Often with vesico-bullous eruption of hands and feet	12	2·4
X. Scarlatiniform	3	0·6
XI. Urticarial	3	0·6
XII. Lupus erythematosus	5	1·0
XIII. Erythema multiforme	6	1·2
XIV. Erythema nodosum	5	1·0
XV. Pustular or acneform	4	0·8
XVI. Exfoliative dermatitis	5	1·0

I. Sulphonamide-Light Eruption

(*a*) *Erythemato-papular Type.*—This was the first type of reaction recognized as being due to the sulphonamides, and has been described by Goodman and Levy (1937), Ballenger *et al.* (1937), and Hallam (1939), among others. More recently, excellent descriptions of cases occurring in the Middle East have been given by Park and Platts (1942) and Park (1943).

This eruption may be seen in patients after oral medication or local application. Prior to 1941 the former was usually the cause, and was not uncommonly seen in peacetime in people who had been treated with sulphapyridine, followed by general ultra-violet irradiation as a tonic treatment. The typical dusky-red erythemato-papular rash, limited exactly to the areas exposed to light, disappeared spontaneously in 24 to 48 hours, and the patient did not remain light-sensitive. The type due to local application was rarely seen in civil life, but proved to be moderately common in Army dermatology. It was usually associated with a typical sulphonamide contact dermatitis (see below), and disappeared rapidly without treatment; 47 such cases were noted.

Illustrative Case.—Bdr. A., aged 25. First seen on June 22, 1943. He was admitted to a field ambulance with a gunshot wound of the lower left thigh, which had been treated by his R.M.O. with sulphanilamide powder and a shell dressing. For the next three weeks sulphanilamide powder was applied daily; he was then evacuated to the base, as the wound seemed more septic and a dermatitis had appeared. On June 21 a rash broke out on the face, neck, hands, arms, and knees. On examination he had a typical sulphonamide contact dermatitis of the left thigh, with a characteristic erythemato-papular eruption sharply limited to the exposed areas. In 24 hours the rash on the face and limbs had faded, and by July 5 the dermatitis had healed thoroughly.

(*b*) *Vesicular Type.*—Only one case of this kind was observed.

Illustrative Case.—Bdr. B., aged 24; admitted to hospital on Sept. 7, 1943. On Aug. 24 he received a kick on the shin while playing football; a superficial graze resulted. This was dressed at his unit with sulphanilamide powder, which was reapplied daily for seven days. On Aug. 31 he noticed small blisters on the back of the hands, and two days later his hands, face, neck, and knees were covered with hundreds of small blisters. He was sent to hospital as a case of smallpox, as there had been one or two cases in the neighbourhood. On examination the original graze was found healed, with a constellation of vesicles around; these were the size of seed pearls, and were exactly localized to the skin to which the dressing had been applied. The exposed areas of the skin—the face, neck (including the upper sternal area), forearms, hands, and knees—were studded with similar vesicles. These had a non-inflammatory base, were quite discrete, and cultures from them were sterile. Otherwise the skin was healthy except for pityriasis simplex capitis and perlèche. With a soothing and mildly astringent lotion (liq. plumbi subacetat. fort. in calamine lotion) the eruption disappeared in five days, but full recovery was retarded by the appearance of boils on the neck He was returned to duty on Oct. 10, 1943.

(*c*) *Severe Type—Bullous, Crusted, and Oedematous.*—This was by far the commonest type of sulphonamide rash (309 cases), and accounted for over 60% of the total series. Though not unusual in the U.K., this type seen over-seas was usually of a severity unknown at home. Strong sunlight played its part, yet some of the worst cases were observed in Italy in Jan., 1944, when the weather was extremely cold and bitter, with little sun. It was significant that the syndrome was rarely recognized before the admission of the patient to hospital, the diagnosis usually being "severe impetigo" (often "with cheiropompholyx") or "pyodermia"; thus many unfortunate men were dosed with large quantities of sulphonamide tablets, with deplorable results. A great proportion of the patients were cases of impetigo which had been treated with sulphanilamide powder. The condition is best described by two illustrative cases:

Case 1.—Pte. C., aged 28; admitted Feb. 25, 1944. This patient was a medical orderly in an infantry unit at the Anzio beach-head; from Feb. 14 to 20 his chief duty had been the treatment of wounds with a sulphanilamide insufflator. On Feb. 20 he suddenly developed a crusted oozing rash which covered his face like a mask, accompanied by a rise in temperature (i.e., a sulphonamide-light eruption). This was diagnosed as an acute impetigo, and he was given sulphanilamide tablets (7 g.) during the 22nd and 23rd. His eyes became inflamed, with intense photophobia; the whole face was swollen, and blisters appeared on the back of the hands. He was then evacuated to hospital. On examination the whole of the face and neck was a confluent crusted mass, with oedema of the eyelids and intense photophobia; the lips were swollen, crusted, and haemorrhagic; the back of the hands and the proximal phalanges were covered with a septic vesico-bullous eruption. Though he had been wearing battledress, the areas exposed in summer (arms, neck, and knees) showed slight desquamation. By March 11 the skin was healed but still dry and taut. It was gradually exposed to direct sunlight, which caused a slight recurrence on the 20th, after 20 minutes' exposure, but he was able to tolerate full exposure to the sun for several hours by April 12. He was discharged on April 17, able to bare his body to sunlight for the whole day, and was recommended for indoor duties. He had spent 56 days in hospital. He kept well till Aug. 10, when for no apparent reason he had a violent recurrence. He was readmitted to hospital and sent home by hospital ship.

Case 2.—Gunner O., aged 29; admitted on June 2, 1944. In Oct., 1943, this patient had impetigo, which was treated with sulphanilamide powder; he developed a sulphonamide-light eruption which healed after three weeks, leaving no photosensitivity. In Dec., 1943, he sustained a slight wound of the arm, and, despite his statement that he was "sulphonamide-sensitive," this was treated with sulphanilamide and vaselined gauze (S.V.G.). The usual rash appeared. and disappeared in four weeks. On June 3, 1944, he was wounded in the right thigh by shrapnel; this time, thinking it would be of no avail, he did not warn the medical officer that he was sensitive to sulphonamides. He had the wound dressed with sulphanilamide powder, and was given 2.5 g. of sulphanilamide. The next day he was sent to hospital with a moderately severe eruption. On admission the face, neck, upper part of the chest, and the hands and arms were covered with a weeping crusted rash with considerable swelling. The lower lip was raw and cracked. His skin healed well on 1% hydrarg. ammon. in Lassar's paste applied as a mask and as spreads, and he was discharged from hospital on June 23, tolerant to light. A label was affixed to his pay-book warning that he was sulphonamide-sensitive. He has kept well since.

Treatment of Type 1*c*

1. *Local.*—It was soon found that many drugs did not suit these cases, while others seemed to act almost as specifics. Saline soaks, ichthyol, but above all the flavine series, were unsuitable. In many instances the application of acriflavine had caused a marked exacerbation, and in five cases the use of this drug had produced a typical sulphonamide contact or light dermatitis in patients who had had this some months before, but who had not had any sulphonamide applied since that time. In this connexion the article by Russell and Beck (1944), pointing out the dangers of sulphonamide-proflavine mixtures in experimental wounds in rabbits, seems to show that each drug enhances the toxic reaction of the other. It was found that in the crusted oedematous phase the most suitable dressing was lead and calamine or lead and zinc lotion, applied as wet dressings at least night and morning. Weak eusol or eau d'Alibour was also helpful. When the skin became less moist, with little oozing and crusting, a mask of 1% hydrarg. ammon. in Lassar's paste proved to be the most acceptable dressing: 2% hydrarg. ammon. often seemed to be too powerful, while the skin did not tolerate greasy applications such as ung. hydrarg. ammon. dil. very well. This 1% hydrarg. ammon. paste healed the skin in two or three weeks, except in the severe cases, and it was then necessary to test the patient's tolerance to sunlight. The face, hands, and arms were therefore gradually exposed to light—on the first day for 5 minutes, the second day for 7 minutes, the third day for 10 minutes, and so on until the patient could bare his whole body for at least four hours to a strong sun. At first the skin was protected by an anti-light cream—quinoline derivatives and phenol salicylate were not available, and quinine sulphate creams proved of little use. The best cream was 5% tannic acid in a tragacanth or a lanette wax cream, which was applied liberally before exposure to the sun. Quercitannic acid, extracted from the cork oak in North Africa, was tried, but proved inferior to ordinary tannic acid. In the healing stage these sulphonamide-light eruptions closely resembled an impetiginized seborrhoeic dermatitis, and the drugs used in this condition were often employed—e.g., gentian violet 1%, silver nitrate 2%, etc. Penicillin cream also proved useful.

2. *General.*—(i) *Vitamin B complex* seemed to be indicated, as the photosensitivity brought to mind a nicotinic acid deficiency, and the crusted lesions of the mouth, the naso-labial folds, and the ears reminded one of a lack of riboflavin. Therefore yeast (in the form of D.C.L. tablets and dried yeast), multivite tablets, and stout were given in maximal dosage. The response was disappointing, though the impression was that yeast tablets seemed to have most beneficial effect. With the dose given the patients felt the "nicotinic acid flush," but the light sensitivity persisted as much as in those cases which were not given extra vitamins.

(ii) *Quinine sulphate and hydrochloride* were given to 20 cases—the doses being 5 gr. thrice daily—as they have been used with some beneficial effect in other dermatoses associated with sensitivity to sunlight—e.g., lupus erythematosus and erythema multiforme. In some cases the skin could tolerate full exposure to light after three or four days, but the photosensitivity returned after stopping the drug.

(iii) *Peptone* (5%, given subcutaneously thrice a week) was used in several severe cases, as its complex components seem to contain a substance or substances antagonistic to the sulphonamides (Heathcote, 1944). It had no effect whatsoever.

(iv) *Vaccines* were employed in many cases, as the predominant growth in every case was *Staph. haemolyticus*; they were helpful in patients with pustules and furuncles but had no other effect.

(v) *Penicillin*, given intramuscularly, proved to be the most useful drug of all. It was used in a dosage ranging from 500,000 to 1,250,000 units, depending on the severity of the case. So far 23 cases have been treated. The sepsis usually disappeared within five days, leaving a tender healing skin. It had, of course, no effect on the light sensitivity.

(vi) *Sulphonamides.*—It was relatively easy to desensitize patients to the sulphonamides by starting with a tiny dose and increasing it daily. This, however, had no influence on the photosensitization; it was therefore of little practical value, and was discontinued.

(*d*) *Telangiectatic Type.*—This was seen in 4 cases, and was always the end-result of repeated attacks of a mild sulphonamide–light dermatitis. Two of the patients had been affected for over two years, the others for about four months. All had a typical appearance, somewhat reminiscent of a mild radiodermatitis—i.e., mottled pigmentation, fine telangiectasia, and early atrophy of the skin—associated with scattered islands of impetigo. One patient had some pre-carcinomatous keratoses. In all cases the condition was localized to the face, the "V" of the neck, and the back of the hands.

Illustrative Case.—Pte. E., aged 24; admitted to hospital on Oct. 21, 1944. Except for mild dandruff his skin had always been healthy. On June 28, 1944, he was wounded through the leg, which was dressed with sulphanilamide powder and then acriflavine. Three days after wounding a spotty rash appeared on the face and arms, which soon became crusted. He noticed that his lips were cracked and swollen. The erythema subsided but the crusting persisted. Various applications were used, and penicillin powder caused an acute exacerbation. On admission he showed pigmentation and telangiectasia of the brow, cheeks, neck, and lips, and odd patches of impetigo on the cheeks and brow. The latter cleared slowly but steadily with 1% gentian violet used alternately with 1% hydrarg. ammon. paste. Because of the atrophic changes he was invalided home.

II. Contact-type Dermatitis

This type was observed in 51 cases. It appears to have been first noted by York (1942), who described the treatment of 96 cases of staphylococcal infection of the skin: one boy with impetigo of the scalp developed a reaction—i.e., "punched-out ulcers appeared at the edge of the lesions," and healed readily on ammoniated mercury ointment.

According to the excellent papers on sulphonamide eruptions by Tate and Klorfajn (1944a, 1944b), this form of sulphonamide sensitivity seemed to be far commoner in the Middle East than the photosensitization type, which was so prevalent in North Africa and Italy. The reaction occurred most often on the limbs, but was seen occasionally on the head and trunk. Once a few cases had been seen a "spot diagnosis" was easily made, and confirmed by taking the history, but 5 cases (already mentioned) were healed sulphonamide dermatitis reactivated by acriflavine. The original lesion—usually a wound or a graze—had practically healed as a rule, and was surrounded either by bullae or, when they had ruptured, by small superficial ulcers, about 1 cm. in diameter, stippling a raw denuded surface. These ulcers were filled with a thin pus, which on culture gave a pure growth of *Staph. haemolyticus*, except for two cases which produced a growth of *Ps. pyocyanea*, with sparse colonies of *Staph. haemolyticus*: the latter cases had the clinical appearance of pemphigus foliaceus, with the typical large flaccid bullae and musty odour.

The ordinary sulphonamide contact dermatitis yielded rapidly to treatment: either wet dressings of lead and zinc lotion or weak eusol healed the ulcers quickly, and a dressing of Lassar's paste or zinc ointment protected the skin during the final healing phase.

Illustrative Case.—Lieut. F., aged 31; admitted to hospital on March 10, 1944. Six weeks before admission he grazed his left elbow while playing football; the injury "went septic," and sulphanilamide powder was applied on three occasions. A marked spread of the infection ensued, so that the whole arm was affected. On examination it was seen that the original graze had healed completely. The whole forearm, from the deltoid to the wrist, was covered with septic blisters and small septic ulcers, with considerable areas of denuded skin. Wet dressings of lead and zinc lotion were applied, and on March 22 the arm had healed, leaving many healed erythematous areas. He was seen again two months later, and his skin had remained well.

III. Infectious Eczematoid Dermatitis Type

This always began as a typical sulphonamide contact dermatitis, but the staphylococcal infection spread as impetiginous or ecthymatous lesions over the limbs, ears, and beard region. Thirty-one cases of this type were admitted; some of these had become markedly eczematized, and thus resistant to treatment. When seen in the early stages, however, the prognosis was excellent, and a speedy recovery was made. This type, like the contact one, is described by Tate and Klorfajn (1944a, 1944b).

Illustrative Case.—B.S.M. G., aged 25; admitted to hospital on March 23, 1944. On Feb. 19 a superficial gunshot wound of the left lower leg was treated with S.V.G. After several applications the wound had almost healed, but the surrounding skin became raw and weeping, with septic bullae and superficial ulceration. The dermatitis spread until the whole leg was involved, and sores and blisters appeared on the arms, ears, chin, and neck. There was no photosensitivity. Both the leg and the secondary lesions healed quickly on penicillin cream (250 units in a lanette wax and adeps lanae cream).

IV. Disseminated Neurodermatitis Type

Only 4 cases of this type were seen; they were precisely similar except that one began after treatment of a wound in the thigh, two from patches of infective dermatitis, and one after sulphanilamide ointment had been applied to a patch of circumscribed neurodermatitis (lichen simplex chronicus) over the sacral region. The application of the sulphanilamide caused a sudden dissemination of erythemato-papular lesions with some lichenification on the neck, on the flexor surfaces of the forearms, especially in the antecubital fossae, and on the front of the thighs. None of these cases had any previous history, or family history, of skin disease.

Illustrative Case.—A.B. H., aged 32; admitted to hospital on May 30, 1944. About six months previously he felt an irritation just above the natal cleft, which caused him to scratch the part violently. Gradually the skin of that area became thick and leathery and intensely pruritic. He was seen by his doctor, who prescribed a 5% sulphanilamide ointment. After a few applications the rash spread "all over the body." The appearance on examination was typical of "eczéma neuropathique"; there was an erythemato-papular rash scattered over large areas of the body, with some lichenification and pigmentation. On the sacral area was a large thickened plaque of lichen simplex chronicus (Vidal). The patient, though a sailor with an almost heroic record, was a nervous introspective individual, intensely worried about home troubles. The resolution of these played an important part in the clearing of his skin condition, and he was returned to duty on June 20, with practically no itching but some residual lichenification, after treatment with crude gas tar.

V. Vesicular Type

Four cases of the vesicular type of rash were admitted, two being due to oral administration and two to local application of sulphonamides. The prognosis of these was excellent, as the vesicles rapidly disappeared, and the men could be returned to their units in a short space of time. Three were sent to hospital as cases of suspected smallpox: when the vesiculation was localized mainly to the exposed areas the appearance and distribution certainly suggested this diagnosis.

Case 1.—Lieut. I., aged 24. This officer was admitted to hospital on May 28, 1944, for treatment of an attack of bacillary dysentery, for which he was given sulphaguanidine tablets. When he had taken them for two days a vesicular rash appeared all over his body, and vanished in three or four days. A week later the tablets were again administered, and again a precisely similar rash appeared.

Case 2.—Dvr. J., aged 23, Sinhalese; admitted to hospital on May 8, 1944. For 2½ months this patient had had a dermatitis of the back of the left hand after an abrasion. On May 4 this became septic; acriflavine dressings were applied and sulphapyridine tablets (14 g.) given by mouth. On the 5th he developed malaise, giddiness, and a generalized rash, with intense pruritus. His body was covered by a vesicular rash, not unlike variola; the back of the left hand was raw and ulcerated, with marked oedema. In a week the generalized eruption had gone, but the original dermatitis of the hand did not heal completely till June 4. Though no sulphonamide had been applied to the patch of dermatitis the acriflavine had produced a typical sulphonamide contact dermatitis.

VI. Generalized Bullous (Pemphigoid)

Only one case of this type was seen, and only one could be found described in the literature available—that in the paper by Shaffer *et al.* (1943).

Illustrative Case.—Lieut. K., aged 34; Polish officer; admitted to hospital under the care of Major H. C. Johnston, R.A.M.C., venereologist. This patient had contracted gonorrhoea, which his medical officer began to treat with sulphathiazole; after two days a slight rash appeared on the trunk, and the drug was stopped. However, the patient was determined to have sulphonamide treatment, and managed to secure some sulphathiazole in an illicit manner. He took two tablets, and next day was admitted to hospital with a generalized bullous eruption. He was extremely toxic and appeared to be desperately ill. His condition was very much like a true pemphigus, as the rash was entirely bullous, and Nikolsky's sign was positive; lesions were present on the tongue and the buccal mucous membrane. In order to treat his gonorrhoea, as well as any sepsis present, he was given penicillin intramuscularly: after 100,000 units the bullae disappeared, the mouth healed, and the skin was well within 7 days. His general health, however, remained poor, and even after some weeks at a convalescent depot he complained of weakness and lack of energy.

VII. Fixed Type of Drug Eruption

In this series—from Feb., 1943, to June, 1944—only one case of this type was seen, but since that time two other patients have reported with it. The eruption is essentially similar to the fixed erythema due to other drugs, such as phenolphthalein, the barbiturates, and arsenic. Since 1939, when Loveman and Simon described "sulphonamide fixed drug" eruption, several cases have been reported in the literature—by Director (1943), Dostrovski and Sagher (1944), and Freeman (1944), among others.

Illustrative Case.—Lieut.-Col. L. had for some years been troubled with a recurrent antral sinusitis, and obtained speedy relief by taking small doses of sulphanilamide, sulphathiazole, or sulphadiazine. As a rule the drug was used orally, but more recently he had been taking sulphathiazole powder as a snuff. Some months before, three scaly pigmented patches had gradually appeared on the face and chest, somewhat like a discoid lupus erythematosus. Each time sulphonamides were taken the patches became erythematous, swollen, and intensely pruritic. Macroscopic examination showed three circular, deeply pigmented lichenified plaques on the chin, forehead, and chest. The coloration was dark brown, there being no lilac tint and no follicular plugging. A histological section revealed a picture of chronic inflammation—hyperkeratosis, some acanthosis, increase of blood supply, and an intense round-cell infiltration.

VIII. Purpuric

In a severe case of sulphonamide dermatitis it is a common occurrence to observe purpuric lesions, particularly on the legs, but it is definitely unusual for the rash to be entirely purpuric in character. Shaffer mentions that purpura may be met with in sulphonamide eruptions, and I have now seen 8 cases with only a purpuric rash, 3 of these in the present series. Of the 8, one was due to administration of sulphanilamide tablets and the others to the local application of the powder. The rash in each case soon faded, leaving brown pigmentation.

Illustrative Case.—Capt. M., aged 31, was admitted to hospital with an ulcer on the front of the leg; this had appeared suddenly for no apparent reason 10 days previously. The sore was treated by the daily application of sulphanilamide powder. On examination a typical diphtheritic ulcer was seen; surrounding this was a plaque of purpuric skin, exactly square in shape—i.e., precisely the size of the white lint dressing which had been impregnated with the powder.

IX. Morbilliform

This rash is one of the commonest due to the sulphonamides, and usually occurs after oral administration. Though only 8 cases are included in this series, many others occurred in the hospitals in Africa and Italy. The eruption being well recognized by physicians and surgeons, the drug was withdrawn and the rash soon faded, so that the dermatologist did not often have the opportunity of seeing the reaction in full efflorescence. The rash is most pronounced on the trunk as a rule, but may affect all the skin and cause a vesico-bullous eruption of the hands and feet, with intense pruritus. It is precisely similar to the drug eruption due to the barbiturates—e.g., medinal—and, of course, no photosensitization develops.

Illustrative Case.—Sgt. N., aged 28, was admitted to hospital on Feb. 29, 1944, with an extensive infectious eczematoid dermatitis, which had begun after the secondary infection of an abrasion. The arms, legs, and buttocks were affected by crusted septic patches of dermatitis. After initial improvement he had a relapse on March 8, and on the 9th was given sulphanilamide tablets. After 4 g. he developed a morbilliform rash on the trunk, limbs, and face, with a vesico-bullous eruption of the palms and soles. By the 13th the rash had disappeared except for some pigmentation, and a "gumboil" had suddenly made its presence felt in the lower jaw. Radiography showed evidence of a large apical abscess; the tooth was extracted, and his dermatitis healed rapidly and steadily. His skin two months later was still perfectly well.

X. Scarlatiniform

Only 2 cases of this type were seen, perhaps chiefly because it is an evanescent rash and usually disappears within 24 or 48 hours. The whole body may be affected, but as a rule the trunk is the main site of the eruption. Like the morbilliform, this type does not seem to be associated with photosensitivity, and patients who have had this rash tend to have the same manifestation if sulphonamides are given again.

Illustrative Case.—Spr. O., aged 22; admitted to hospital on March 16, 1944. Thirteen weeks previously he developed a boil on the right ankle. This was treated with S.V.G. for about a week, after which a weeping eruption appeared on the surrounding skin (i.e., sulphonamide contact dermatitis). On March 11, as the leg seemed to be "septic," he was given 5 tablets (2.5 g.) of sulphanilamide. Five hours later a rash appeared over the whole body, and the dermatitis of the ankle became much more pronounced. On admission he was covered with a scarlatiniform rash, and had a temperature of 102° F. The dermatitis of the right ankle was a typical sulphonamide contact dermatitis. By March 24 the leg had almost healed (the scarlatiniform eruption had disappeared by the 19th), but he had developed numerous boils. He was evacuated on the 25th, as beds were urgently required for fresh admissions.

XI. Urticarial

Two cases of acute urticaria after administration of sulphonamides were seen—one after sulphathiazole and one after sulphathiazole and sulphaguanidine. In both the rash faded in two or three days.

Illustrative Case.—Tpr. P., aged 24, was admitted to hospital on June 8, 1944, because of diarrhoea. His story was interesting. About the end of May he sustained multiple but superficial wounds, and was admitted to a casualty clearing station, where he was given sulphathiazole tablets by mouth. The next day a generalized rash appeared, apparently urticarial in nature; it vanished in two or three days. On June 8 he had a sudden attack of diarrhoea, and was transferred to the medical division of the hospital. On the 12th he was given sulphaguanidine, and next day was covered with urticaria, which disappeared in 12 hours. On July 2 he had further diarrhoea; 12 tablets of sulphaguanidine were administered, and in 3 hours the urticaria again erupted, disappearing within 12 hours.

XII. Lupus Erythematosus Type

The 5 cases seen were all patients who had been treated with oral sulphonamides for chest conditions—wounds with infected haemothorax or bronchopneumonia. The rash appeared after at least 30 g. had been given. It was exactly similar to an acute lupus erythematosus, and involved the cheeks, nose, brow, and sometimes the "V" of the neck, with the typical colour, scaling, and follicular plugging, but disappeared except for some desquamation in 7 to 10 days after stopping the drug and applying ichthyol-calamine lotion.

Illustrative Case.—Pte. Q., aged 21, was admitted to hospital in May, 1944, with a severe penetrating chest wound, which had caused an infected haemothorax. He was operated on by No. 2 Surgical Chest Team, and given sulphathiazole by mouth. His general condition improved steadily, but after 28 g. of the drug he developed erythematous lesions on the cheeks and brow, the appearance and distribution of which were most suggestive of lupus erythematosus.

XIII. Erythema Multiforme Type

In 5 of the 6 cases seen the eruption was a typical erythema multiforme, and each patient gave a history of having a sore throat, which was treated with sulphonamides orally. It is possible that the rash might have appeared whether the drugs had been used or not, as the lesions and course of the disease were indistinguishable from true erythema multiforme. One case, however, was somewhat different. This patient was a sergeant who had had severe abdominal wounds which necessitated major surgery. The damage was skilfully repaired; he was given sulphanilamide, but his temperature remained high for no apparent reason. As either a streptococcal or a staphylococcal septicaemia was feared despite sterile blood cultures, the sulphanilamide was stopped and sulphathiazole used instead.

The temperature still remained high, and an erythematous rash appeared on his neck. This was a patch of erythema multiforme. The drug was withdrawn, and in two days his temperature fell, the rash disappeared, and he made an uninterrupted recovery.

XIV. Erythema Nodosum Type

Some of the 5 in this group were quite ordinary cases of this disease, while two showed circinate erythematous plaques which were more superficial than the typical erythema nodosum and were not extremely tender. Similar lesions have been described by Miescher (1943) as occurring on the limbs and face after oral sulphathiazole.

Illustrative Case.—Guardsman R., aged 26, was admitted to hospital with a cellulitis of the leg following an abrasion, and was given sulphathiazole by mouth. Within 24 hours the front parts of the legs were studded with numerous tender indurated erythematous plaques, which gradually disappeared, leaving brown pigmentation. A general examination, including radiography of the chest, revealed no physical changes.

XV. Pustular or Acneform Type

Though Shaffer *et al.* (1943) have described a case of pustular exacerbation of an acne vulgaris after oral sulphathiazole in a man whose skin had been sensitized by the previous use of a sulphathiazole lotion, the 4 cases in this series were all seen as an end-result of sulphonamide medication. The patients had either had a sulphonamide–light eruption, which had disappeared, leaving pustular lesions on the face, or had had a sulphonamide contact dermatitis, which had healed, leaving a persistent folliculitis that had proved difficult to clear.

Illustrative Case.—Spr. S., aged 32, was admitted to hospital in May, 1944, with a sulphonamide contact dermatitis of the left leg. Three weeks before admission he had grazed the calf of his leg on barbed wire, and sulphanilamide powder had been applied daily as a dressing. After 7 days the graze had practically healed, but a weeping dermatitis about 4 in. square developed. This healed rapidly on wet dressings of lead and calamine lotion, but follicular pustular lesions which were present persisted for 7 weeks after the original dermatitis had healed.

XVI. Exfoliative Dermatitis

Many patients, of course, had a complete exfoliation as the drug rash faded, especially in the morbilliform and scarlatiniform types, but in 5 a severe exfoliative dermatitis was produced, chiefly by the combination of local and oral sulphonamides. Some of these took many weeks to get better, and three patients had to be invalided home.

Illustrative Case.—Pte. T., aged 23, was admitted to hospital on March 10, 1943. For three months he had had a "running ear," treated in various ways, including insufflation with sulphanilamide powder. By February the pinna was involved and the eyebrows became crusted. He was admitted to a forward hospital, where the ears were treated daily with sulphanilamide powder and he was given sulphanilamide tablets four-hourly. A severe generalized dermatitis developed, and he was evacuated towards the base. In Dec., 1942, insufflations of sulphanilamide powder had cured his "running ear" in 4 or 5 days. About the end of Jan., 1943, he developed impetigo of both ears; this gradually spread to the face, and he was admitted to hospital in a forward area, where the infection was treated with sulphanilamide powder. The crusting spread rapidly after this (i.e., sulphonamide contact (dermatitis), and he was then given sulphanilamide tablets four-hourly (number unknown). Within 24 hours of swallowing the first tablets his face swelled, with marked oedema of the eyelids, conjunctivitis, and photophobia. The face and neck were crusted and oozing, a mass of blisters appeared on the hands, and a rash erupted all over the body. When first seen, on March 10, 1943, after he had been evacuated towards the base, he had a generalized exfoliative dermatitis, all the skin of the body being raw and crusted and the lips, tongue, and buccal mucous membrane swollen and ulcerated. There were purpuric lesions on the legs, and the scrotum was oedematous and raw. The temperature was 102° F.; pulse rate, 112. Urine: albumin +; sugar −; bilirubin +++; porphyrins −. He was extremely ill and toxic.

Discussion

In the Central Mediterranean theatre skin sensitization due to sulphonamides ranks as an important problem: every patient with a chronic seborrhoeic dermatitis or a particularly severe impetigo has to be questioned closely regarding sudden exacerbation or photosensitization after the application of a powder or ointment or after the ingestion of tablets. In July, 1943, the Director of Medical Services, A.F.H.Q., B.N.A.F., issued an instruction that sulphonamides should not be used in skin conditions or minor injuries except under the direct supervision of a dermatological specialist. This order was repeated on several occasions, while at a later date surgeons were warned about the dangers of sulphonamide powders for ear disease, and the necessity for avoiding prolonged use of these powders in wounds and burns.

Fortunately, most of the rashes due to internal administration of the drugs soon disappeared, unless the skin had been previously sensitized by local application. Internal medication can precipitate any of the various kinds of eruption, even the contact type, once the skin has been sensitized. Thus the erythematous and morbilliform and the fixed types do not matter greatly. On the other hand, the bullous (pemphigoid) eruption may be a grave illness, and the patient may even die (Kennedy, personal communication), while Shaffer *et al.* report two cases which each took four months to recover. It resembles "butchers' pemphigus," and the patient appears to be extremely ill. The rapid response to a comparatively small dose of penicillin (100,000 units—it was a precious drug at that time) of the single case reported here is definitely encouraging.

The two forms which caused most trouble to the dermatologist were the contact and light eruptions. The great proportion of cases of sulphonamide contact dermatitis healed rapidly with appropriate treatment, but only too often the patients were admitted to hospital with a chronic eczematous process that tended to relapse after apparent cure.

More distressing still were some of the cases which had become photosensitive. The mild erythemato-papular type caused little disability, and the light sensitivity soon disappeared. The severe cases, admitted with oedema and crusting of the exposed areas, cheilitis, conjunctivitis, and a high temperature, took weeks or months to recover, and the tendency to relapse was so evident that the greater number were invalided home even though their skins seemed healthy. For example, out of a series of 65 cases, mild and severe, seen in North Africa in 1943, over 20 were sent home from that country; of the remainder, 11 were seen again in Italy in 1944 and invalided home with (1) a recurrence of their light sensitivity, sometimes but not always due to a further use of sulphonamides or acriflavine —5 cases; or (2) chronic eczema—3 cases; or (3) resistant staphylococcal infections (e.g., recurrent impetigo or seborrhoeic dermatitis, chronic furunculosis or folliculitis)—3 cases. These men seemed to have a skin unable to resist staphylococcal infections.

Four patients were seen with the telangiectatic type of sulphonamide–light eruption; their future may also be viewed with some concern, the atrophy, pigmentation, and telangiectasia having the appearance of a radiodermatitis or mild xerodermia pigmentosa rather than a chronic solar dermatitis, though only one had pre-carcinomatous lesions.

It is difficult to assess how long a man will remain sensitive to light. In the mild erythemato-papular cases the patient may well be able to tolerate light within 48 hours, while in the worse types men have been seen still photosensitive after 2½ years. The amount of the drug does not seem to play an important part, as some of the worst cases had had only two or three applications of sulphanilamide powder, and some of those who recovered rapidly had been dosed with large quantities of assorted sulphonamides.

The chronic cases do not resemble other light dermatoses, such as Hutchinson's summer prurigo, but are to all intents and purposes cases of chronic seborrhoeic dermatitis with a profuse dandruff, crusting of the eyebrows, chin, and ears, and often flexural seborrhoea. A careful history will elicit the use of sulphonamides and exacerbation on exposure to light localized to the face, neck, hands, arms, and knees.

It was significant that sulphanilamide in powder form was most liable to cause sensitization, but sulphanilamide in vaseline is almost as bad. This drug, probably because it was most commonly employed, was responsible for over 90% of all reactions. Only a few cases were caused by sulphadiazine and sulphaguanidine. Most patients appeared to be sensitized to all the sulphonamide drugs, but occasionally there was a selective sensitization, well described by Park in a recent paper.

The treatment of skin conditions such as impetigo, seborrhoeic dermatitis, and secondarily infected tinea led to the greatest number of reactions:

Dermatoses	62.66%
Otitis externa	4.00%
Wounds	13.00%
Grazes and minor injuries	14.33%
Burns	4.00%
Other diseases (e.g., tonsillitis, appendicitis)	2.00%

It seems impossible to determine what percentage of people treated by sulphonamides locally develop sensitization, but it is interesting to note the experience of other dermatologists in treating skin infections with these drugs. For instance, Pillsbury *et al.* (1941) treated 190 varied cases with no evidence of absorption and no local or general reaction; Kalz and Prinz (1942) treated 130 patients with no systemic effects and no mention of dermatitis; York (1942) had one case of contact dermatitis in 96 cases; the Robinsons (1941), in a series of 48 cases of impetigo, had two cases of contact dermatitis; Glicklich (1942) saw no toxic effects in 42 cases; Ingels (1943) had 10 cases of sensitivity in 300 cases; with microcrystalline sulphathiazole Bigger and Hodgson (1944) had one case of sensitivity in 50 cases treated; of 196 patients treated by Costello *et al.* (1942) 21 had skin reactions—i.e., of 1,052 cases treated 3.5% became sulphonamide-sensitive. Before I abandoned the local application of these drugs, out of 400 cases treated with 5% sulphathiazole paste or cream I observed 4 which developed photosensitization, either mild or severe.

There seems to be little doubt that sulphonamides can be applied to the skin, as Pillsbury (1944) says, with little risk of causing sensitization if the process is not an eczematous one and the drug is used for not longer than 5 days in the form of a thick paste or water-miscible cream; but as diseases such as impetigo can be treated satisfactorily by other methods, it appears that sulphonamides should no longer be used as a topical application.

In 1943 I performed various tests on men with the light eruption. Patch tests gave erratic results, as they were invariably positive on areas previously affected by the rash—i.e., the parts exposed to light—and usually negative on other parts of the skin. Scratch and intradermal tests were rarely used, as they tended to cause (as often happens with these tests) an exacerbation of the original condition.

Complexion had, it appeared, little or no significance in this series of cases—in fact, the rufous type seemed less prone to severe reactions, while the worst cases were seen in men with dark hair and skin. Photosensitization was seen in Indians, Gurkhas, Sinhalese, and men of negro stock.

The incidence of sulphonamide reactions in the U.S. Forces seemed to be much lower than in United Kingdom, Dominion, or Empire troops: light eruptions were rarely seen, but occasionally the other types occurred. Two busy American dermatologists practising during the twelve months of 1944 in the same theatre of war saw in their own group of patients only 4 cases each that were definitely due to the sulphonamide series. Several reasons for this extraordinary difference may be suggested, but the most important are that the commonest way of using sulphonamides locally in the U.S. Medical Corps was in the form of 5% sulphadiazine in a water-miscible cream, and that acriflavine was seldom employed. Not unnaturally, American colleagues were sceptical of the high incidence in British troops until they were absolutely convinced by the numbers of cases shown them.

Summary

From Feb., 1943, to Dec., 1944, over 650 cases of cutaneous sensitivity to sulphonamides have been seen in North Africa and Italy; of these, 500 are reported and classified into 16 various types.

These reactions were due to the treatment of many different conditions, from major wounds and burns to slight grazes, impetigo, and chancroid.

Only 3 of the types described are liable to cause a grave or prolonged illness—i.e., the pemphigoid, the sulphonamide-light eruption, and the sulphonamide contact dermatitis.

Sulphonamide-light dermatitis accounted for 72.2%, and contact dermatitis and its complications for 17.2%—i.e., 90% of the total.

Most cases of reaction were due to the use of sulphanilamide in powder form; the safest drugs appeared to be sulphadiazine and sulphaguanidine.

Acriflavine can reactivate a sulphonamide-light or contact dermatitis just as may cocaine.

No race is exempt from this sensitization—skin colour and texture make little or no difference.

Sulphonamide reactions are uncommon in U.S. troops compared with British.

The local application of sulphonamides is contraindicated in skin diseases, though there is little risk if the drugs are used with certain precautions.

Intramuscular penicillin appears to be the treatment of choice in two types—the pemphigoid and the severe light dermatitis.

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PREVENTION OF SEA-SICKNESS IN ASSAULT CRAFT

A REPORT OF EXPERIMENTS UNDER TROPICAL CONDITIONS

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Assault landings in combined operations entail the transport of large numbers of men in small craft over seas which may be rough. Previous experience in operations (such as the invasion of Sicily) and in training has shown how disabling sea-sickness can be to troops taking part in such landings. In many countries a number of remedies have been tested in the search for a means of preventing or mitigating sea-sickness without impairment of the fighting efficiency of troops when disembarked on the beaches.

From the reports of previous workers it appears that the most efficient remedy is hyoscine (Holling, McArdle, and Trotter, 1944; Holling and Trotter, 1944); other members of the atropine series are less effective. Amphetamine (benzedrine) had been claimed by Hill (quoted by Jowett, 1943) to reduce the sickness rate dramatically, but was found by Jowett and Thomson (1943) to be ineffective. A combination of hyoscine with amphetamine has been claimed (Jowett, 1943; Jowett and Thomson, 1943) to be highly effective. Chlorbutol has been found of little value (Holling and Trotter, 1944).

The possibility of side-effects being produced by hyoscine has been the subject of much research. The reduction in salivation, with consequent dryness of the mouth, is merely inconvenient. But the effects on the eye might, if severe, interfere with efficient shooting, observation, etc.; the sedative action might produce drowsiness; and, most important of all in tropical climates, the reduction in sweating might prove dangerous from interference with heat-loss. Both in Britain and in India tests with this drug have been carried out to determine whether these effects are pronounced enough to detract from its beneficial action in sea-sickness. Its effects on the stamina of troops and on their ability to perform complicated mechanical operations (stripping and reassembly of Bren guns, etc.) have been studied, and the performances of treated and untreated groups of men on the rifle range compared. Ophthalmological investigation of possible effects on accommodation and fine eye movements has been carried out (Wilson, quoted by Holling and Trotter, 1944). All reports agree that no undesirable effects are produced by the drug in the doses advocated for the relief of sea-sickness.

Studies have been made on two individuals working in a hot chamber reproducing tropical conditions, but no large-scale tests have so far been reported.

The experiments described in the present paper were carried out to determine the influence of this and other drugs on the incidence of sea-sickness among troops of various nationalities, and on the possible production of undesirable side-effects, under tropical conditions.

Material.—A group of over 5,000 men in training was used for the tests. The racial composition of the men was as follows: British troops, 1,667; Indian troops, 3,673; mixed (composition not recorded), 400. The various sects and races of Indian troops observed were: Punjabi Mussulmans, 637; Dogras, 206; Pathans, 316; Gurkhas, 1,586; mixed (Ajmirs, Brahmins, Ahirs, Moslems, Mundas, and Hoes), 928.

Meteorological Conditions.—The experiments were carried out on the west coast of India in latitude 19° N. during the month of May, approximately one month before the monsoon. Climatic conditions were average for place and season (see Table VII). Briefly, temperature and humidity were such as to favour the development of heat-stroke or heat-exhaustion in individuals performing strenuous exercise; sea conditions were never rough enough to produce more than 15 to 25% of sickness among unseasoned troops sailing in small craft.

Methods

During the investigation the troops were engaged on a full scheme of training, and experiments had to be designed so as not to interfere with this programme. In general it was impracticable to send parties of men to sea for the sole purpose of testing sea-sickness. Each experimental observation had to be fitted into the scheme of an assault exercise, planned and unalterable. This was usually possible, while still observing the essential conditions of the experiment—viz.: (1) the simultaneous observation under identical conditions of large numbers of men sailing at the same time in similar craft from the same starting-point to the same destination; and (2) their division into two or more groups of comparable size, one such group receiving inactive tablets (controls), while the other group or groups received tablets of the substance under test. Tablets were distributed one hour before embarkation to the selected groups of men, either by R.A.M.C. orderlies attached for duty in these experiments or by company commanders under the guidance of the unit medical officer. Particular care was taken to ensure that every man swallowed his prescribed pill. In all experiments the men in test and control groups alike were given paper vomit-bags, a supply of sweets, biscuits, and chewing-gum, and were instructed in the simple measures found by previous workers to reduce sickness among men crowded in small craft (i.e., keeping the deck clean by using bags for vomiting; eating a biscuit or a few sweets if slight nausea occurred). The chewing-gum was intended to reduce the unpleasant dryness of the mouth with hyoscine, but was given to all, irrespective of what drug they received.

The principles on which an experiment was planned may best be understood by consideration of an example.

Experiment V.—2/Blankshires; May 8/9, 1944

Three assault companies of a battalion, sailing in nine "Landing Craft Assault" (L.C.A.s) at 22.30 hours from the same point, were due to land on a beach at 02.00 hours and carry out an assault. Each L.C.A. carries 35 men, and the personnel allocated to each craft was given a serial number. Three serials or boat-loads were allotted to each company: Nos. 1–3, 4–6, and 7–9 respectively to the first, second, and third companies. Serial 10 was composed of Headquarters staff. Serials 11, 12, and 13 were made up of various auxiliary troops sailing in 3 L.C.A.s; serials 14, 15, and 16 carried the three platoons of the reserve company in 3 L.C.A.s. Serials 11–13 sailed at 22.30 hours and disembarked at 02.20 hours on the same beach as serials 1–9; serials 14–16 sailed at 23.40 hours and disembarked at 02.45 hours on the same assault beach. In addition several "Landing Craft Mechanized" (L.C.M.s) were employed, carrying few men in addition to their vehicle loads, and three larger craft—one "Landing Craft Infantry (Large)" (L.C.I.(L.)), and two "Landing Craft Tank" (L.C.T.s). The former carried 185 men of various units, sailing at 17.00 hours the afternoon before the assault, and landing at 03.45 hours. The L.C.T.s carried respectively 66 and 81 men, sailing at 21.45 hours and 19.30 hours respectively from a different jetty, and landing their troops at 04.00 and 05.15 hours respectively.

In planning the experiment the first nine serials carrying the three assault companies were treated as a group. The remedies to be tested and the control tablets were distributed as follows:

Serial No.	Remedy	
1	Sod. bicarb.	each 1 platoon of 1st Coy.
2	Hyoscine	
3	Ergotamine	
4	Sod. bicarb.	each 1 platoon of 2nd Coy.
5	Hyoscine	
6	Ergotamine	
7	Sod. bicarb.	each 1 platoon of 3rd Coy.
8	Hyoscine	
9	Ergotamine	

The other six L.C.A.s (omitting HQ. in serial 10) were also treated as a group, and remedies distributed as follows:

Serial No.	Remedy	
11	Hyoscine	mixed troops
12	Hyoscine plus ergotamine	
13	Sod. bicarb.	
14	Hyoscine	each 1 platoon of reserve company
15	Hyoscine plus ergotamine	
16	Sod. bicarb.	

The men on the larger craft (serials 21, 22, and 23, sailing in the L.C.I.(L.) and L.C.T.s) were divided into roughly equal groups on each ship. To one party was given hyoscine, to the other sodium bicarbonate. It will be noted that in these craft controls and test groups were mingled, while in the smaller L.C.A.s carrying 30 to 35 men all individuals in one craft had the same pill—active or dummy, as the case might be. The small number of men carried in the L.C.M.s were omitted from the experiment.

Trained nursing orderlies, R.A.M.C., detailed for this duty, sailed in each craft as observers, one to each L.C.A., six in the L.C.I.(L.), and two to each L.C.T. They were provided with forms on which to record the names of all seen to vomit or noted to suffer from nausea. Details of actual times of sailing and disembarking, of entering and leaving rough waters, of lying "hove-to," and the code letter of the remedy administered to troops on board had to be entered in the spaces provided on the form. The orderlies followed the troops for half an hour after disembarkation to note any sign of illness or incapacity among the men. Arrangements had been made to deal with heat-stroke cases, should such occur.

It was considered that opinions regarding the military efficiency of the men would have most value if expressed by their own officers. Familiar with their men's usual behaviour, and with the particular situation as it developed on the beaches, they could be relied on to detect any abnormal reactions.

Figures from the analysis of the results of this experiment will be found in the Tables and the discussion below. It will be noted that in assessing the efficiency of a remedy due regard is paid to comparison with the control group sailing in identical craft over the same course at the same time.

Of 17 experiments, Nos. V, VI, and VII were of this type. Experiments I, II, and III were similar, except that in these the exercise was carried out by companies of infantry without ancillary troops; all serials sailed in L.C.A.s. Experiment VIII was an observation of a group selected out of over 5,000 men taking part in a large-scale exercise; it is discussed in detail below.

In several experiments (Nos. IX, X, XIV, XVI, and XVII) parties of men were sent to sea for a six-hour trip in "country-craft." These were 170-ton ocean-going dhows, all exactly similar. In each experiment a party of 150 men was divided into two groups of 75, each sailing in one dhow; to one group was given the remedy under test, to the other an inactive pill. So far as was possible the craft sailed together, under identical

conditions, and remained at sea for the same time. R.A.M.C. observers sailed on each to record the incidence of sea-sickness. These trips were all by day; no exertion was demanded of the troops on disembarkation.

In another series of experiments parties of 120 to 200 men with R.A.M.C. observers sailed on an L.C.I.(L.) for a six-hour trip (Expts. XI, XII, and XIII). The men on board were divided into three groups without selection. To one group (controls) the inactive pills were given; to each of the other groups was given one of the remedies under test. No exertion was demanded of the troops on landing.

Remedies Tested.—Since hyoscine had already proved in other countries to be the drug of choice, and since data were required on its action in Indian troops and under tropical conditions, this remedy in a dose of 1/100 gr. was chosen for special study. In view of the preference expressed by other workers for a combination of hyoscine (1/100 gr.) with amphetamine (5 mg.) a number of experiments were made in order to compare the efficiency of this combination with that of hyoscine alone. Ergotamine (0.5 mg.) was also tested, alone and in combination with hyoscine (1/100 gr.), because of its known power to relieve the nausea, etc., of migraine and the possible benefit to sea-sick subjects of the "sympathicotonic" type. Chlorbutol in doses of 10 gr. was compared with hyoscine (1/100 gr.) under controlled conditions.

Heat-stroke Precautions.—The season and climate in which the experiments were carried out rendered heat casualties likely among large bodies of troops engaged in strenuous work. In view of the possible effect of hyoscine in suppression of sweating, preparations were made for the treatment of heat casualties on a large scale should they occur.

A consolidated summary of all valid experiments is given in Table I. The average incidence of vomiting recorded in 1,385 control subjects was 12.4%; an additional 3.6% were nauseated. The total personnel affected in the control group was thus 16%. Rough comparisons only are permissible from this table in considering the figures for sickness incidence with various remedies, since the aggregate figures for many experiments are being compared rather than the figure for each remedy contrasted with its twin control group.

For comparison of the preventive effect of various remedies a "protective index" is advocated by Holling *et al.* (1944). This is obtained from the formula

$$\text{P.I.} = \frac{\%\ \text{Sick in control group} - \%\ \text{Sick in test group}}{\%\ \text{Sick in control group}} \times 100$$

This expression "shows the percentage of the sick in the control group who presumably would not have been affected if they had been in the test group" (quoted from the statistician's report on our experiments). This index for each experiment is given in the analytical tables. The indices in Table I show that ergotamine used alone fails to protect an appreciable percentage of susceptible individuals, while hyoscine alone or in combination with amphetamine protects over 70% of those liable to sea-sickness.

More exact analyses of these figures are given in Tables II to IV, in which figures for each remedy are compared with those from exactly comparable control groups. For example, in Table II (a) figures for hyoscine-treated individuals and controls, all sailing in L.C.A.s under exactly comparable conditions, are contrasted; and so for other series.

TABLE I.—*Incidence of Sea-sickness with Various Drugs: Consolidated Results*

Expt. No.	Total Men Observed	Control Group			Hyoscine			Hyoscine plus Amphetamine			Hyoscine plus Ergotamine			Chlorbutol			Ergotamine		
		No. in Grp.	No. Vomiting	No. with Nausea	No. in Grp.	No. Vomiting	No. with Nausea	No. in Grp.	No. Vomiting	No. with Nausea	No. in Grp.	No. Vomiting	No. with Nausea	No. in Grp.	No. Vomiting	No. with Nausea	No. in Grp.	No. Vomiting	No. with Nausea
I	305	104	9	5	100	1	0	101	4	2	—	—	—	—	—	—	—	—	—
II	413	137	20	14	138	6	4	138	12	1	—	—	—	—	—	—	—	—	—
III	395	128	33	2	129	3	1	138	2	3	—	—	—	—	—	—	—	—	—
V	752	305	20	1	313	1	0	—	—	—	52	2	0	—	—	—	82	10	3
VI*	516	173	12	0	175	9	0	—	—	—	64	0	0	—	—	—	104	12	0
VIII	544	282	34	12	262	7	0	—	—	—	—	—	—	—	—	—	—	—	—
IX	152	76	24	0	—	—	—	—	—	—	—	—	—	76	9	0	—	—	—
XV	411	105	10	6	103	0	1	105	0	0	—	—	—	98	9	1	—	—	—
XVI	150	75	9	10	—	—	—	—	—	—	—	—	—	75	3	0	—	—	—
Totals	3,638	1,385	171	50	1,220	27	6	482	18	6	116	2	0	249	21	1	186	22	3
Vomited ..			12·4%			2·2%			3·7%			1·7%			8·4%			11·8%	
Nauseated ..			3·6%			0·5%			1·2%			0			0·4%			1·6%	
Total Affected ..			16·0%			2·7%			4·9%			1·7%			8·8%			13·4%	
Protective Index: Vomiting						82·3%			71·8%			86·3%			32·2%			4·8%	
Protective Index: Total Affected ..						83·1%			69·4%			89·4%			45·0%			16·2%	

* Figures from large craft (1 L.C.I.(L.); 2 L.C.T.s) are omitted from analysis because sickness incidence in these was insignificant in both control and test groups.

Results and Discussion

1. Action in Prevention of Sea-sickness

In the course of 17 experiments a total of 5,740 men were subjected to tests. Among these were 2,206 men to whom inert "placebo" tablets of chalk or sodium bicarbonate had been given, and who acted as controls for the groups receiving the active drugs. Owing to various causes a large number of results had to be discarded as useless for analysis.

Because of calm seas, the sickness rates in the control groups in eight experiments averaged only 2.3%. Such experiments are useless for estimating the potency of remedies, and were discarded. Again, on two occasions after men had taken their remedies as issued the sailing of the craft was cancelled for naval reasons. In a third group the men on a L.C.I.(L.) were at sea for 21 hours; they had been issued with their remedies 13 hours after embarking and 8 hours before landing. A number were ill before the remedies were given, and a number of others more than six hours later, when the period of expected action of the drugs was over. The effect of the remedies during their period of likely action could not therefore be accurately assessed, and the experiment was discarded.

The total number of observations discarded was 2,102; the observations remaining for analysis total 3,638.

TABLE II.—*Effect of Hyoscine on Sea-sickness*

Type of Craft	Expt. No.	Control Group			Hyoscine Group			Protective Index	
		No. in Group	No. Vomiting	No. with Nausea	No. in Group	No. Vomiting	No. with Nausea	For Vomiting	For Total Affected
(a) L.C.A.s	I	104	9	5	100	1	0		
	II	137	20	14	138	6	4		
	III	128	33	2	129	3	1		
	V (a)	89	8	0	93	0	0		
	V (b)	52	8	0	52	0	0		
	VI	103	11	0	104	7	0		
	VIII (a)	104	18	12	105	4	0		
	VIII (b)	102	4	4	105	3	5		
	XV	105	10	6	103	0	1		
Totals		924	121	43	929	24	11	80·1%	98·7%
Percentages ..			13·1%	4·7%		2·6%	1·2%		
(b) L.C.I.(L.)	V	100	2	1	85	0	0		
L.C.T.s	V	64	2	0	83	1	0		
L.C.M.s	VIII	31	5	2	24	0	0		
L.C.M.s	VIII	45	8	4	23	0	0		
Totals		240	17	7	215	1	0	93·0%	95·0%
Percentages ..			7·1%	2·9%		0·5%	0		

TABLE III.—*Effects of Hyoscine plus Amphetamine, of Hyoscine plus Ergotamine, and of Hyoscine on Sea-sickness*

Type of Craft	Expt. No.	Control Group			Hyoscine and Amphetamine			Hyoscine and Ergotamine			Hyoscine Only			Protective Indices					
														Vomiting			Total Affected		
		No. in Grp.	No. Vomiting	No. with Nausea	No. in Grp.	No. Vomiting	No. with Nausea	No. in Grp.	No. Vomiting	No. with Nausea	No. in Grp.	No. Vomiting	No. with Nausea	H. & A.	H. & E.	H.	H. & A.	H. & E.	H.
(a) L.C.A.s	I	104	9	5	101	4	2	—	—	—	100	1	0						
	II	137	20	14	138	12	1	—	—	—	138	6	4						
	III	128	33	2	138	2	3	—	—	—	129	3	1						
Totals		369	62	21	377	18	6	—	—	—	367	10	5						
Percentages ..			18·8%	5·7%		4·8%	1·6%	—	—	—		2·7%	1·35%	71·4%	—	83·9%	71·6%	—	82·0%
(b) L.C.A.s	V	52	8	0	—	—	—	52	2	0	52	0	0						
Percentages ..			15·4%	0	—	—	—		3·8%	0		Nil		—	75·3%	100·0%	—	75·3%	100·0%

TABLE IV.—*Effects of Ergotamine and of Chlorbutol in Sea-sickness*

Type of Craft	Expt. No.	Control Group			Ergotamine Group			Chlorbutol Group			Protective Index	
		No. in Group	No. Vomiting	No. with Nausea	No. in Group	No. Vomiting	No. with Nausea	No. in Group	No. Vomiting	No. with Nausea	For Vomiting	For Total Affected
(a) L.C.A.s	V	89	8	0	82	10	3	—	—	—		
L.C.A.s	VI	103	11	0	104	12	0	—	—	—		
Totals		192	19	0	186	22	3	—	—	—		
Percentages ..			9·9%	0		11·8%	1·6%	—	—	—	Less than zero	Less than zero
(b) Dhows	IX	76	24	0	—	—	—	76	9	0		
Dhows	XVI	75	9	10	—	—	—	75	3	0		
Totals		151	33	10	—	—	—	151	12	0		
Percentages ..			21·8%	6·6%	—	—	—		7·9%	0	63·6%	72·2%
(c) L.C.A.s	XV	105	10	6	—	—	—	98	9	1		
Percentages			9·5%	5·7%	—	—	—		9·2%	1·0%	3·2%	32·9%

The individual hyoscine experiments of Table II were analysed, evaluating the protective index in each experiment, to determine (*a*) the range of value, and (*b*) whether the index varies significantly with the sickness incidence in the control group. The results of this analysis are given in Table V.

TABLE V.—*Analysis of Protective Indices in Individual Experiments: Remedy, Hyoscine; Craft, L.C.A.s*

Expt. No.	Total Observed		Vomited		Total Affected		Protective Index	
	Controls	Test Group	Controls (%)	Test Group (%)	Controls (%)	Test Group (%)	Vomiting (%)	Total Affected (%)
I	104	100	8·6	1·0	13·4	1·0	88·3	92·5
II	137	138	14·6	4·4	24·8	7·3	69·8	70·6
III	128	129	25·3	2·3	27·3	3·0	90·9	89·0
V (a)	89	93	9·0	0	9·0	0	100·0	100·0
V (b)	52	52	15·4	0	15·4	0	100·0	100·0
VI	103	104	10·7	6·7	10·7	6·7	37·4	37·4
VIII (a)	104	105	17·3	3·8	28·8	3·8	78·0	86·8
VIII (b)	102	105	2·9	2·8	6·8	7·5	0·34	minus
XV	105	103	9·5	0	14·3	1·0	100·0	93·0

With two exceptions—Expts. VI and VIII (b)—the values of the protective index are all over 70%. The two strikingly low indices require further consideration.

Expt. VI.—In this experiment the remedies were administered to the troops as they boarded their craft, immediately before putting to sea. In other experiments of this series the remedies were given about one hour before sailing. There had not been sufficient time for absorption of the drug before the men were exposed to rough seas.

Expt. VIII (b).—In this case there is a discrepancy between the figures recorded by the R.A.M.C. observers and those reported by the men's company commander. The latter reported 7% of the test group sick, and 25% of the control group. The observers' figures have been retained to avoid any suspicion of manipulation of results. The protective index as calculated from the company commander's figures would indicate protection of the same order (72%) as in the other experiments in Table V.

Acclimatization.—Repeated exposure of the same individuals to the motion of the craft at sea was noted to produce some reduction in the incidence of sickness among the control (untreated) group in successive experiments. Possible fallacies in the experimental results due to this acclimatization were avoided through the method adopted of comparison of treated groups in all cases with a control group of similar individuals sailing under identical conditions.

Statistical Analysis of Results.—The results were reviewed by the Central Statistical Section, G.H.Q. (India). Values of χ^2 and of P calculated for each experiment are given in Table VI. The statistician's estimate of the reliability of each result is given in the final column of the table.

The results for hyoscine, with the exception of Expt. VI, are "reliable" or "highly reliable." The figures from Table II (a), derived from observations on 929 instances of hyoscine administration, have a probability of less than 1 in 100,000 that the observed effects were due to chance. The results for hyoscine plus amphetamine also are assessed as "highly reliable," with a probability of their being fortuitous of less than 1 in 10,000. The statistician considers, therefore, that the observed differ-

TABLE VI.—*Statistical Analysis of Tabulated Results*

(χ^2 = Measure of statistical reliability of the result. P = Probability that the result is independent of the use of the drug.)

No. of Table Analysed	Type of Craft	Drug Administered	Protective Index	Total Cover Index	χ^2	P	Reliability of Result	Remarks on Reliability
II (a)	L.C.A.s	Hyoscine	78·7%	96·2%	94·6	<0·00001	Highly reliable	Large sample; 929 men
II (b)	L.C.M.s L.C.T.s L.C.I.(L)	"	95·0%	99·5%	19·5	<0·0001	Reliable	Good sample; 215 men
III (a)	L.C.A.s	"	82·0%	96·0%	58·7	<0·0001	"	Good sample; 367 men
	L.C.A.s	Hyoscine and amphetamine	72·0%	93·0%	35·8	<0·0001	"	Good sample; 377 men
III (b)	L.C.A.s	Hyoscine	100·0%	100·0%	8·7	0·003	Not reliable	Sample too small for reliability
	L.C.A.s	Hyoscine and ergotamine	75·3%	96·2%	4·0	0·045	"	Small sample; 52 men
IV (a)	L.C.A.s	Ergotamine	0	86·5%	0·92	0·337	* "	Good sample*; 186 men
IV (b)	Dhows	Chlorbutol	72·2%	92·1%	20·4	<0·0001	Reliable	Good sample; 151 men
IV (c)	L.C.A.s	"	32·9%	89·8%	1·1	0·294	*Not reliable	Good sample*; 98 men

* In these cases χ^2 is low although the samples are large enough to give a significant result. This suggests lack of efficiency of the drug used.

ences in protective indices for the two remedies are probably real. Further analysis by another method (standard deviations) confirmed this conclusion. This implies that the observed lower figures for protection by hyoscine plus amphetamine express an actual inferiority to hyoscine alone, under the conditions of the experiments.

The results for ergotamine, alone and combined with hyoscine, are assessed as "not reliable," since there are probabilities of from 337 in 1,000 to 45 in 1,000 that such results as were observed might be due to chance. In the footnote to Table VI it is pointed out that the unreliability of the results for ergotamine is not due to small samples. The low value for χ^2 is dependent on low observed differences between sickness rates in test and control groups. This statistically suggests that the drug (ergotamine) is not an effective remedy.

So, also, the results for chlorbutol in L.C.A.s are "not reliable," with a nearly 30% chance of error. The figures for chlorbutol derived from observations in dhows, however, are "reliable" and the chance that the results observed were unconnected with the remedy is less than 1 in 10,000. The wide disparity between the chlorbutol results in the two types of craft has not been explained. Further experiments would be required to define the efficacy of this drug.

Comparison of "Protective Index" and "Total Cover Index."—The protective index of Holling *et al.* has already been described. The "total cover index" is the percentage of men not affected in the test group, and includes those naturally immune plus those protected by the remedy given. From it the expectation of sickness with a given remedy is known. The values of both indices are given in Table VI.

Comparative Efficacy of Drugs.—Of the remedies tested in which the results are acceptable to the statisticians the degree of protection afforded by hyoscine is the highest, being throughout of the order of 80% as gauged by the protective index, and 96% as gauged by the total cover index. Hyoscine plus amphetamine gives somewhat lower figures, with a protective index of 72% and a total cover index of 93.6%. Chlorbutol in dhows shows protection of the same order (75% and 92% by the two indices).

2. Hyoscine and Heat-stroke

From Table VII it will be seen that during the investigation hyoscine was administered to a large number of men. The

TABLE VII.—*Meteorological Conditions during Hyoscine Experiments*

Expt. No.	Total Men Engaged	No. of Men c Hyoscine	Nature of Exercise	Time of Day	Meteor. Conditions				Observed Effects of Heat
					Cloud	Temp. Max.	Temp. Min.	Humidity	
I	305	201	Moderate	Dawn	9/10	90·7	79·2	83%	Nil
II	413	278	"	"	9/10	90·9	79·6	90%	"
III	395	267	"	"	9/10	90·7	82·0	80%	"
IV	41	20	Light	Day	5/10	92·8	81·0	88%	"
V	752	365	Moderate	Night	—	92·8	81·0	88%	"
VI	814	359	"	"	—	93·4	82·8	77%	"
VII	625	248	"	"	—	90·3	81·2	78%	"
VIII	5,461	424	Strenuous	Day and Night	2-4/10	92·3	81·0	81%	*2 treated: *1 death
X	150	75	Nil	Day	2/10	92·0	81·0	78%	Nil
XI	120	74	Moderate	"	3/10	92·2	81·3	73%	"
XII	200	132	Nil	"	3/10	92·2	81·3	73%	"
XIII	120	80	"	"	5/10	93·0	81·0	75%	"
XV	411	208	"	"	5/10	92·2	82·1	81%	"

* All among personnel *not* receiving hyoscine.

subjects were in part British troops (780) and in part Indian troops of many races and sects (1,951). Throughout the period of the experiments the climatic conditions were favourable for the development of heat-stroke and heat-exhaustion, as is shown by the meteorological data in the table. In the great majority of cases (2,213) the men who had had hyoscine underwent fairly strenuous exertion immediately after landing on assault beaches, comparable in degree to that demanded by actual battle conditions.

Throughout these experiments, in which over 2,700 men were given hyoscine, no case of heat-stroke occurred among those who had had the drug.

On one large-scale exercise (Expt. VIII) 424 men had hyoscine and carried out a very strenuous assault without incident. During this exercise one fatal case of heat-stroke occurred in a British soldier. This man was in the "control" company of a battalion that had had a pill of chalk at midnight on May 16–17. He disembarked with his unit at 09.00 hours on May 17, carried out strenuous military work all through a hot and brilliant day in an area where water was short, and developed symptoms of an urgent nature at about 18.00 hours. He died at 20.00 hours that evening. Post-mortem examination revealed no evidence of malaria or other infection. A most careful check was made, and there is no doubt that he had had a chalk pill. Of six other cases treated in medical units that day for "effects of heat," four proved to have infections (two coryza, one malaria, and one a superficial cutaneous infection); two were genuine cases of heat-exhaustion. One was a Sepoy, the other a British N.C.O.; neither of them had had any pill, active or inert.

From the results of the experiments it is concluded that hyoscine in the dosage employed (1/100 gr.) does not predispose to heat-stroke or heat-exhaustion among British or Indian troops carrying out full duty in assault exercises under tropical conditions.

3. Hyoscine and Military Efficiency

After the first few experiments various instances were brought to our notice in which men had apparently failed to carry out their duties efficiently, and the question of drug action arose. In one case an officer attributed his display of gross inefficiency to a pill he had had some hours before; it was shown that in fact he had had sodium bicarbonate. In other cases officers and men complained of feeling sleepy on landing in the early hours of the morning; in some cases a hyoscine action could not be excluded, though in others the pill given had been inert. It was soon apparent that there was a tendency among troops to ascribe to drug action any shortcomings in their behaviour during the exercises. On discussion with the officer commanding the troops in training, it was decided to make a large-scale test of the effects of hyoscine on efficiency rather than, as had been intended, to undertake a large-scale test of sea-sickness prevention.

Expt. VIII.—In each assault battalion (one British, one Indian) it was arranged to give hyoscine to one company, an inert pill to a second, and no pill of any kind to a third. The reserve battalion (Indian troops) were similarly treated. A smaller number of personnel of various artillery units were similarly subdivided, groups receiving respectively hyoscine, an inert pill, and no remedy. A supply of tablets of chalk, in shape and size approximating as closely as possible to the hyoscine tablets used, was secured for this experiment. The nature of the pills issued to individuals, companies, etc., was not known to anyone but us two.

The usual observations on sea-sickness incidence were made by R.A.M.C. observers, while detailed reports on efficiency of troops were called for from company and troop commanders, and from officers commanding units.

In this exercise a full-scale assault had to be carried out on beaches, with penetration inland over difficult hill country with scrub and bush. Troops were engaged in as nearly as possible battle conditions for a period of 36 to 48 hours. The experiment thus afforded a good test of whether hyoscine predisposed to the development of ill effects from heat or had any other effect on military efficiency. The reports from individual commanding officers, etc., may be summarized as follows:

Force Commander.—Generally speaking, the men were not seriously affected by hyoscine; some complained of drowsiness—as often as not those who had had the dummy pill. But one company of Pathans appeared to have been sleepy and incapable of reasonable action for an hour after landing; these men had had hyoscine. This same company had also complained of drowsiness on a previous occasion, when only one-third had had hyoscine.

Officer Commanding a British Battalion.—No complaint of inefficiency noted.

Officer Commanding an Indian Battalion.—One company commander complained that his men appeared "doped" on landing, and carried out an unusual manœuvre after disembarkation, earning adverse criticism in consequence. These were the Pathans referred to by the Force Commander. (It was later learned that their unusual manœuvre had been planned some days before the assault!)

Officer Commanding another Indian Battalion.—Reported signs of "dopiness" among men of one company on landing, which "wore off quickly once ashore." This company, unknown to him, had had hyoscine. It is to be noted that this battalion disembarked on a very gently shelving beach, and that the men had to cross a wide water-gap in wading ashore. This was

considered by the umpires to have induced hesitation in disembarking.

Officer Commanding a Field Regiment and Anti-aircraft Battery (British Personnel).—No impairment of efficiency noted. In both these artillery units the experiment had been planned so as to include, in test and control groups alike, a number of individuals whose duties involved arduous physical labour or mental concentration.

The Commandant of the Training Centre stated that he personally did not consider that the remedies given interfered with the efficiency of the troops engaged. He stated that their performance compared very favourably with that of previous (and untreated) groups in training.

In considering the evidence it must be remembered that all the exercises in which excessive drowsiness was a source of complaint were carried out at night. Landings in general were at dawn, and the sea trips were made during the early hours of the morning after embarkation at or before midnight. Lack of sleep thus played a part in inducing drowsiness, as did the undoubted sleep-inducing effects of the motion of the craft. Further, such complaints as were received came from a relatively small section of the total subjects engaged, and the responsibility of the drug was not clearly established.

The balance of opinion, including that of senior officers observing the troops at work, was that untoward effects on military efficiency were not produced.

Summary

Experiments on the prevention of sea-sickness were carried out in the Tropics during the training of troops under conditions closely approximating those of battle. British (1,667) and Indian (3,673) troops were used for tests.

In all experiments, vomit-bags, sweets, biscuits, and chewing-gum were issued to all men taking part, and men were allowed to stand up in the craft if they so desired.

Assault craft of various types (L.C.A.s, L.C.M.s, L.C.T.s, L.C.I.(L.)s) were used for all but a few experiments in which 170-ton dhows were employed.

In all experiments control groups receiving inert pills were observed under conditions identical to those of the test group(s). Usually control and test groups were each of approximately 100 men.

The drugs tested and the number of observations on each were: hyoscine (1,990); hyoscine plus amphetamine (625); hyoscine plus ergotamine (116); chlorbutol (619); ergotamine (116).

After rejection of 2,102 observations rendered valueless by calm seas, etc., 3,638 remained for analysis. The validity of the results has been statistically assessed. A high degree of reliability is shown for those for hyoscine, hyoscine plus amphetamine, and for some chlorbutol experiments.

Of the remedies tested, hyoscine 1/100 gr. proved most effective. The degree of protection was of the order of four-fifths of those susceptible. This degree of protection was observed in relatively calm seas, when the sickness rate in controls was 16%.

No case of heat-stroke or heat-exhaustion occurred among 2,731 men who were given hyoscine. The average maximum and minimum temperatures during the experiments were 91.9° and 82.1° F., with an average relative humidity of 80%. Considerable physical exertion was performed by 1,789 of the treated men on assault exercises; a further 424 carried out a very strenuous assault during an exercise in which one fatal case of heat-stroke and two cases of heat-exhaustion occurred among 5,000 untreated troops.

The conditions of the tests were such as to reveal any impairment of military efficiency. Drowsiness in landing-craft was general in all experiments, in untreated as well as treated groups. Only on two occasions (and these involving the same men) was there a possibility that one company might have been adversely affected by hyoscine. Executive officers did not attribute shortcomings of the troops during exercises to the effect of any drug.

We are indebted to Lieut.-Gen. Gordon Wilson, C.B.E., *M.C.*, Director of Medical Services, General Headquarters, India, for permission to publish these results. It is a pleasure to record our appreciation of the co-operation and assistance so willingly given us by the Central Statistical Section of G.H.Q., India. Our thanks are also due to the officers commanding the training centre and the troops in training, as well as to their staffs, for the generous facilities afforded us and for the interest they displayed in the work.

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HUMAN CREEPING MYIASIS

REPORT OF A CASE

BY

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Very few cases of human creeping myiasis have been reported and none described very fully, so that the following case may be of interest to both physicians and parasitologists.

Clinical History

The patient (K. C., W.857), a boy aged 14, was admitted on Jan. 21, 1944, to University College Hospital. He lived in South London, and had the normal activities of a boy of his age. He had never been abroad, and had left home only for holidays at Brighton or Shoreham, where he used to visit the harbour; but he had not done this during the previous two years. He often used to go on Epsom Downs to fly model aeroplanes. He had no allergic personal or family history, but was sometimes bitten by insects and he whealed markedly as a result. His general health was good. Twelve months before admission he began having prickly pains over the shoulders and chest—"like a needle pricking the skin"—associated with aching pains in the shoulders and legs. These continued, without causing much inconvenience, in bouts about twice monthly for six months and then stopped. In July, 1943, he first noticed a swelling in the skin, not reddened, about 3 cm. in diameter, giving rise to a pricking pain on pressure but otherwise painless. It lasted two days and then disappeared. From then on he had many similar swellings, usually single, occurring at various sites (left calf, right popliteal area, left shoulder, back, and the back of the head and neck). They were 1 to 5 cm. in diameter and raised 0.5 to 1 cm. above the skin. They were red or skin-coloured, and caused a pricking pain on being touched, but did not throb. They usually remained for a few days and then disappeared, but the boy had from time to time the sensation of something moving beneath the skin, and he thought that the lumps sometimes moved, going down at one place and coming up near by at another.

On Dec. 30, 1943, one of these swellings came up on the right thigh, and in a short time showed a black spot in the centre. It was fomented, and on Jan. 2 burst, discharging sero-sanguineous fluid. The cavity was syringed by a doctor, and a white maggot emerged. At that time the boy had a severe sore throat, which subsided uneventfully. He was shortly afterwards seen at the Hospital for Tropical Diseases and found to have an eosinophilia of 54%. He was then referred to U.C.H., where his course was as follows:

Jan. 21, 1944.—On admission there were no swellings and the skin was normal. The patient was a sensible uncomplaining boy in apparently good general health. T. 98.6°, P. 104, R. 20, B.P. 115/80. Blood count: R.B.C. 4,800,000, Hb 100%, W.B.C. 22,000 (neutrophils 35%, lymphocytes 19%, monocytes 2%, eosinophils 44%).

Jan. 24.—Left temporal region painful (throbbing, worse on palpation), no swelling visible. During the night a swelling developed, and next day it involved all the left circumorbital tissues and the frontal region to the roots of the hair, extending just over the midline; it was tender, showed capillary pulsation, was oedematous, and pitted readily on pressure. The skin was reddened, with no circumscribed margin. The palatal fauces were reddened. Soft glands were palpable in left axilla and on right side of neck. Attempts to obtain fluid from the swelling were unsuccessful. T. 103.6°, P. 108, R. 24, in the evening. Blood culture negative. Radiograph of chest negative.

Jan. 27.—Oedema spreading; left eye practically closed. Adrenaline (0.25 c.cm. of 1: 1,000) given subcutaneously with doubtful effect. The oedema then gradually subsided and was gone by Feb. 1, as was also an irregular spiking temperature, present since admission. Urine normal. Stools negative for ova and parasites.

Feb. 6.—In the night the patient developed tenderness over the 7th left rib in the mid-axillary line. At 7 a.m. there was in this situation a small red non-indurated slightly tender raised area, 2 by 1 cm., with a central clear yellowish linear bleb. This was incised, and from immediately below the skin a white segmented maggot, very slightly motile, 1 by 0.3 cm. in size, was shelled out. Temperature 97.4°. The maggot was taken to the London School of Hygiene and Tropical Medicine, and identified by Dr. John Smart of the British Museum (Natural History) as the larva of the warble-fly (*Hypoderma bovis*) in the spineless stage (first instar, according to Knipling's (1935) description).

Feb. 8.—A similar swelling, but with a small dark spot in the centre, was present on the right medial malleolus. It was fomented; but by 8 p.m. the dark spot had disappeared, the swelling being otherwise unchanged. During the day four pink papules, 4 by 1 mm. in size, appeared in a straight line on the front of the left side of the chest, as though distributed along the 4th intercostal space. One

of them was opened, but no maggot was found. Blood count: W.B.C. 20,800 (N. 30%, L. 24%, M. 2%, E. 44%). Erythrocyte sedimentation rate, 12 mm. in 1 hour. During the next five days the papules disappeared.

Feb. 13.—A reddish smooth swelling developed over the medial edge of the right scapula. The patient thought it was one of the papules that had migrated. Next day this swelling had disappeared, but one had come up in the right lumbar region, and the patient thought this also was a migration of the same swelling. *Feb. 15.*—No swellings present.

In the next three weeks, except for a spike to 101.2° on Feb. 16, the patient was afebrile and asymptomatic. Several swellings, similar to that of Feb. 6, developed, and three more specimens were obtained from the left buttock and the right lower leg—one excised and two forced out with ease by squeezing. The small central bleb noted on Feb. 6 was not again seen, but a few swellings showed the dark central spot observed on Feb. 8. Some of them were not touched, and it was noticed that the dark spot would spontaneously disappear in a few hours, though the surrounding swelling generally lasted for one or two days. *Feb. 24.*—Blood count: W.B.C. 20,000 (N. 24%, L. 17%, M. 2%, B. 1%, E. 56%).

No swellings or oedema developed after March 1. On March 7 the patient had a sore throat, which was reddened, and the right anterior cervical glands were swollen. There was no fever and the throat culture contained no pathogens. Symptoms subsided in a few days, and the patient was discharged on March 10. He has had no symptoms or signs since; he was last heard from on Feb. 22, 1945.

Commentary

Cattle are the usual hosts of *Hypoderma* flies, which are usually one of two species—*H. bovis* and *H. lineata*. Great economic loss results, on account of the damage caused to the hides by the emerging larvae. The flies are said (Herms, 1939) to occur throughout the U.S.A., Europe, and Asia. So far as has been ascertained, the adult fly usually lays her eggs on the legs of the host, and this often terrifies the animal, which may plunge about in a frenzy, or rush into water, in an attempt to dislodge the fly. The egg hatches in about a week, and the larva penetrates the skin directly or via a hair follicle. This process, in those cases observed in man (and presumably in our case), is painless. Once inside the host the larva moves about, usually among the viscera, and especially between the muscular and mucous layers of the oesophagus. In autumn, winter, or spring it migrates through the muscular tissues of the back to lie under the skin, through which it bores a hole for respiration. It then moults, and during this time a local purulent reaction develops, causing the "warble," which finally bursts, to allow the larva to fall out and pupate on the ground. The warbles are sometimes treated locally by farmers with derris or phenol.

Cases of human infestation by the warble-fly *Hypoderma bovis* are very rare, and I have found only five in the literature (Herms, 1939; Miller, 1910; Smart, 1939). A case involving the allied species, *H. lineata* (Style, 1924), was probably the first British case of infestation of man by a species of *Hypoderma* to be reported. In our case the boy's sore throat may have been caused by wanderings of the larvae in the oesophageal wall, especially as his pharyngeal flora showed no pathogens at the time. It is hard to be sure when the eggs were laid; the emergence of all the maggots during a period confined to about two months suggests that he was infested only once, or, at any rate, during one season only. This most probably was during the summer of 1943, perhaps while he was asleep on Epsom Downs. The manifestations seem to have been due partly to an allergic response (causing oedema and eosinophilia) and partly to the bodies of the larvae themselves. As the case stands it is impossible with certainty to say whether the larvae migrated in the patient or whether they emerged where oviposition occurred, as has been noted in infestation by other species (Herms, 1939, p. 354); though in view of their widespread distribution over the body, the sensation of "creeping," and the apparent surfacing and sinking of the larvae in the swellings, it seems likely that migration did take place.

I wish to make acknowledgment to the late Sir Thomas Lewis and Prof. P. A. Buxton for their help in preparing this report.

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ABACTERIAL PYURIA

BY

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There exists a condition, provisionally called by the unsatisfactory name of "abacterial pyuria," which is quite well known to urologists, but which is not sufficiently known to medical men as a whole. Of the 15 or so cases which have come under my care in the last six years, one was that of a doctor in full practice who was troubled for months with the condition until the diagnosis was made; another that of a young man who was invalided out of the Army, diagnosed interstitial cystitis; a third was a soldier sent home from the Western Front. It is because of such cases that the following account of the condition is given.

The patient, an adult male, begins to suffer from very frequent and uncomfortable or painful micturition. There may be some associated urethritis sufficient to stain the linen. The urethritis is not constant, and does not precede by much, if at all, the bladder symptoms, which are often the main and only complaint. Fever has not been recognized. At this point the man, if he has a urethral discharge, will be examined for gonorrhoea. The negative bacterial report will probably result in his being given a pot. cit. mixture and a pat on the shoulder—but his frequency will continue. The two-glass test shows an equal amount of pus in the second glass. Heavy treatment with sulphonamides brings no result. The urine is examined bacteriologically, but fails to show organisms in a specimen full of leucocytes. At this point tuberculosis of the urinary tract is suspected because of "pus in a sterile urine." Intravenous urograms show a normal upper urinary tract. Cystoscopy reveals a bladder too irritable for really good examination, but shows a complete cystitis and an angry red mucosa with no portion of the bladder wall uninvolved. A guinea-pig inoculation test for the tubercle bacillus is of course negative.

The above clinical picture warrants a provisional diagnosis of the disease. It is remarkable, and fortunate, that a specific and apparently infallible remedy is to hand. 0.3 g. of neoarsphenamine, given once a week, will improve the condition after two and will apparently cure it after three injections. I do not think I have seen a relapse yet, nor have I observed any systemic complications.

When one has surmounted a natural disinclination to accept a new disease, one begins to recognize peculiarities which make diagnosis easier. A purulent urethritis of non-gonococcal causation is itself rather unusual. When it is associated with marked frequency and a cloudy second glass of urine the disease must be definitely considered. When no organisms, or only a few colonies of an obvious contaminant, are reported in this urine full of leucocytes, there is a strong probability of the condition being present, for tuberculosis of the urinary tract is associated with urethritis with extreme rarity. Moreover, it is not so sudden in its onset, and the urine is as a rule only moderately cloudy. The completely red bladder is not at all like that of tuberculosis, in which there are practically always some areas of bladder almost normal in appearance.

Discussion

Moore (1943) has dealt with the pathology of the condition and with the various views as to its aetiology. My own preference is for the theory that it is caused by a virus—after all, the commonest cause of mucous surface infection in the body. Probably the pathogenic agent will remain unproved until Koch's postulates can be established by human experiment.

There has been recognized of recent years, and especially since the war, a subacute or chronic epididymitis often with little or no evidence of urinary infection. I do not think this can be related to abacterial pyuria, a striking feature of which is the failure of the urinary infection to respond to most forms of treatment.

I have not met with the condition in the female. It is reasonable to ask the question: Is there a vaginitis or cervicitis of similar causation and likely to respond to intravenous neoarsphenamine?

If the cause of abacterial pyuria is a virus, response to organic arsenic is worthy of attention. If one may be permitted to speculate a little—Domagk found prontosil to cure certain

streptococcal infections. Subsequent experimental work produced sulphonamides with effect on other organisms. It would seem worth while re-examining some of Ehrlich's 606 original arsenicals and others, and trying some of them on smallpox, typhus, yellow fever, influenza, etc.,

Abstract of Some Typical Case Histories

D. B. G., aged 40.—First seen May 8, 1941, complaining of five months' painful frequency; some discomfort in the left loin. The urine was cloudy, and contained leucocytes and red blood cells; no organisms; guinea-pig inoculation negative for tubercle. Radiograph—no abnormal shadows; intravenous pyelograms normal. Cystoscopy revealed an intolerant bladder. Indigo carmine came equally and well from the ureters. Three injections each of 0.3 g. N.A.B. were given. On Aug. 15 the urine was clear; a cell was present in only three or four low-power fields.

D. A., aged 49.—First seen April, 1939, complaining of five weeks of frequency and scalding, with the passage of blood. The urine was cloudy; it contained a faint haze of albumin, and microscopically showed degenerate leucocytes. Cystoscopy revealed cystitis; indigo carmine came equally and well. The ureters were catheterized, specimens showing no excess of white blood cells. The laboratory report on the urine was: leucocytes; no organisms. Guinea-pig inoculation was negative for the tubercle bacillus. After the usual three injections of N.A.B. the patient improved, and in June his urine contained a doubtful thread. There was an occasional cell in the first glass; the second glass was clear.

Medical Practitioner, aged 52.—First seen March, 1942, complaining of a urethral discharge, with urgency and frequency of three months' duration. A film had been examined for gonococci, with negative results. Intensive sulphonamide treatment had been given without benefit. The urine (glasses 1 and 2) was cloudy. It contained no organisms in the film. No gonococci were obtained after culture with CO_2 enrichment. The gonococcal fixation test was negative. The usual three injections of N.A.B. were given, and the patient wrote on April 15 to say that he had no urinary symptoms; his urine was clear, and contained no albumin.

T. B., aged 51.—First seen on Nov. 22, 1944, complaining of frequency, every 20 minutes by day and five or six times by night, with some terminal haematuria, of two weeks' duration. The urine was cloudy, contained albumin, and microscopically leucocytes and red blood cells. Cystoscopy revealed a haemorrhagic cystitis. Blue came equally and well from the kidneys. The laboratory reported leucocytes but no organisms. After three injections of N.A.B. he lost his discomfort, and on Jan. 26, 1945, his urine, which was clear, contained a very faint haze of albumin and no leucocytes on microscopical examination.

A. D., aged 35.—First seen Oct. 27, 1944, complaining of frequency and haematuria of sudden onset two weeks before, with pain. The urine contained leucocytes. On cystoscopy the bladder was intolerant and intensely congested. The laboratory reported on the urine on Nov. 2: leucocytes, and on microscopical examination a few Gram-negative bacilli. On Dec. 15 the report on the urine was: leucocytes; no organisms. After three injections of N.A.B. the patient's symptoms were cured, and on Jan. 26, 1945, his urine contained no albumin, and nothing abnormal was seen on microscopical examination.

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At a summer school in social biology which the British Social Hygiene Council is to hold in the Hugh Stewart Hall of University College, Nottingham, from July 28 to Aug. 11, interest will be directed chiefly to problems of education and social life likely to arise through the coming increase in the school-leaving age. The director of the school is Prof. Winifred Cullis, D.Sc. The course is open to all types of teachers, social workers, and members of the general public interested in education and social problems from a biological aspect. The morning lecture programme has been planned to illustrate the aims and content of social biology. Courses of lectures will be given on the place of biology in education, the biological approach to personality, the social aspects of health, the contribution of natural history to social biology, and food production and nutrition. Dr. Mary Collis and Dr. A. C. Tibbits will give an account of the successful scheme of sex-education which they have helped to set going in schools in Nottinghamshire, and this will be followed by a discussion of the technique of sex-instruction in school. At the evening sessions lectures will be given by visiting speakers on the broader application of biological knowledge to human life and culture. A programme of excursions and visits to places of scientific and general interest has been arranged. The inclusive fee for the course is £12 12s. (enrolment fee £1 1s.) and early application should be made to the secretary, British Social Hygiene Council, Tavistock House North, Tavistock Square, London, W.C.1.

NOTES ON ADDER-BITE (ENGLAND AND WALES)

BY

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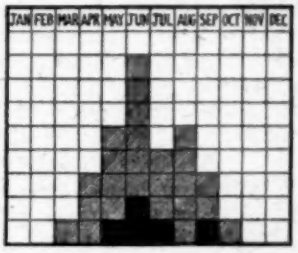
The following notes are based upon accounts of 50 cases, some of them already recorded, the remainder kindly sent me by doctors in many parts of England and Wales in response to a query published in the *Journal* (July 25, 1942, p. 118). Others have been obtained from patients themselves. The aim of the inquiry was to provide an answer to the question, "How serious is adder-bite?"—a question of some interest in view of our complete lack of a specific *V. berus* antivenene, or indeed, since 1940, of supplies of European viper antivenene of any kind.

The adder (*Vipera berus*) is our only poisonous snake. It is common in many parts of the country, though seldom seen owing to its shyness. It hibernates during the colder months, and is seldom in evidence even in summer, unless the day be warm and sunny. It is commonly believed to be most venomous in spring, but in the present series severe bites occurred throughout the season March to October. The diagram shows the month of occurrence of the dated cases; each lightly shaded square represents a case; the darker squares represent the five fatal cases. It is plain that high summer is the season of maximum danger from adder-bite.



Graph showing seasonal incidence of adder-bites in present series.

Situation of Bites.—The bites were all situated distally on the extremities, three-quarters of them being on the hand, the remainder on foot, ankle, or calf, and one on the brow. The most usual sites were a finger (especially the index) or thumb. There was no apparent connexion between the position of the bite and the course and severity of the reaction, except that in the case of the man bitten on the brow collapse was early and complete and unconsciousness of long duration.

Clinical Features

The effects of the bite are general and local. The general reaction, which takes the form of shock or collapse, varies greatly in degree in different cases, whereas the local reaction is more constant, the bitten limb in nearly every case showing massive oedema up to the trunk and haemorrhagic discoloration, usually most pronounced in the neighbourhood of the main lymphatic trunks. The oedema as a rule spreads up the limb to the axilla or groin within six hours, but continues to progress in intensity generally for two days or so, and in severe cases to advance to some extent over the trunk or head.

The general reaction varies between the very slightest malaise on the one hand and profound collapse on the other. About half of the cases were severe enough to occasion real anxiety for the patient's life. In most cases the critical period was of brief duration, the patient being out of danger within 12 hours, but some remained critically ill for several days. Within 20 minutes of the bite the patient begins to feel faint and giddy, or experiences a sensation of constriction of the head; young children begin to be drowsy, and soon become semiconscious. Nausea occurs, and vomiting is usually a prominent feature and may last for days; there may be haematemesis. Colicky pains may occur, and diarrhoea is present in a quarter of the cases. Swelling of lips, face, and tongue is common, or there may be tightness of the throat, severe thirst, difficulty in breathing, or pain attributed to the heart. With the above symptoms collapse sets in. The patient is pale and cyanosed, cold, sweating, and semiconscious or unconscious. The pulse is rapid and thready, often almost or quite impalpable. The pupils may be widely dilated.

Fear may, as is often claimed, play a part in the causation of the early "shock," but it may be completely absent, as in the case of patients who are unaware they have been bitten and have not seen their assailant. As regards the prolongation

of the collapse stage, it is important to note that the severe and prolonged vomiting and diarrhoea, the sweating and the massive localized oedema, are all factors in producing a state of dehydration, important from the therapeutic point of view.

It is commonly at this stage, two or three hours after the bite, that the patient is first seen by a doctor. In most cases by this time the oedema and discoloration have progressed some distance up the limb, and the site of the bite, at first painless, is beginning to be painful. In collapsed patients the swollen limb is often described as being very cold and blue, or even black. Collapse symptoms pass off as a rule about six to eight hours after the bite, and the temperature rises from subnormal to 101 or 102°. This rise may be brief, or slight fever may last from a few days to a week. Diminution of urine is noted at this stage: in one severe case there was anuria for three days. Cardiac depression occurs, evidenced by slow pulse and low blood pressure.

The swelling and haemorrhagic discoloration of the bitten limb increase in extent and intensity for one to three days, and then gradually decline, the various colours of a bruise being manifested. Tenderness is marked, but there is comparatively little pain as a rule; on recovery pain is felt on moving the joints, and there is extreme muscular weakness. In no case was there any septic complication or gangrene. The prevailing fear of the latter sequel appears to be groundless, and is based, no doubt, upon memories of the past, when strong ammonia and other harmful caustics were commonly used in treatment.

Immediate Prognosis and Course of Illness

The most important factors governing the severity of the general reaction appear to be the size of the adder, the age and health of the patient, and the rapidity and correctness of the treatment. As regards age, of 12 cases in subjects under 12 years old all except two were severe. In the "teens" and young adults mild, moderate, and severe reactions occurred in about equal proportions. Of seven cases in persons over 45 years old five were severe.

The age of the patient has a marked effect upon the duration of the illness and disablement. Children, adolescents, and young adults recovered within a fortnight; the only exceptions other than fatal cases were one child whose swelling had not disappeared in four weeks, and another (my own case) who, on first using his bitten leg after 17 days, ran a temperature of 102° for about 24 hours and had symptoms similar to those noted at the onset, as though dormant venom had been liberated into the circulation by movement of the part. In middle-aged and elderly patients resolution is slower. A woman aged 54 had a swollen ankle for three months; a man aged 45 had a swollen arm for over six weeks; and a man aged 57 had some swelling for over a year, then suffered for many months from a stiff and painful shoulder and could not close his fist properly for months after the swelling had subsided. A gamekeeper "nearly lost his life and could not work for at least a year"; a lady states: "It was about six weeks before I could walk properly."

Remote Prognosis

Recovery appears to be complete and without serious after-effects. Dr. Stradling wrote: "Many bitten persons who have recovered from all primary symptoms produced by the poison eventually succumb to its influence, in remote and indirect effects, at a later period," but I have been unable to find evidence to support this view. Four severe cases have remained perfectly well and suffered no after-effects after a lapse of 13, 16, 23, and 24 years respectively since their bites. Two men, severely bitten in youth, have now reached 79 and 81 years of age without observing any after-effects. I have many reports of perfect health for shorter periods.

A doctor aged 60, bitten by very young adders, had only the slightest reactions at the time, but developed endarteritis two years later; he attributed this to his bites, but I gather that medical opinion was divided on the subject. Another doctor, middle-aged, shed all his finger- and toe-nails a year after being bitten, but suffered no other inconvenience and lived to the allotted span. One adult male states that he still, after six years, experiences some swelling and discoloration in the bitten hand each autumn; a woman bitten over 20 years ago still has similar slight local recurrences of oedema. Another man developed phlebitis, starting at the situation (in the leg) where he had been bitten eight years earlier.

Fatal Cases

There have been seven deaths from adder-bite in England and Wales in the last 50 years. I have been unable to trace two of these. The five remaining subjects were aged 11, 4½, 6, 3, and 51 years respectively. The principal features in these cases may be tabulated thus:

No.	Sex	Age	Previous Health	Duration (hours)	Mode of Death
1	M	11	Delicate	12	Collapse; cardio-respiratory failure; conscious
2	M	4½	Healthy	60	Circulatory collapse; unconscious
3	F	3	,,	6	,, ,, ,,
4	F	6	Delicate	36	,, ,, ,,
5	M	51	Insane W.R.+	26	Unconscious, with T. 102°, bounding pulse, and stertorous breathing

Note.—None of the above received antivenene serum.

Summary of Conclusions

The danger of adder-bite is greatest in high summer. Its clinical features are: (1) a local spreading haemorrhagic oedema; (2) a general reaction of very varying degree, from slight weakness to profound collapse.

About 50% of the cases give rise to real anxiety. In young children the "shock" reaction is severe; in the "teens" and young adults mild, moderate, or severe in equal proportions; in persons over 45, generally severe. Children, however, recover much more quickly than adults. Recovery is complete and without after-effects.

Fatal cases are rare, but death can occur even in quite healthy young children. In the fatal cases, none of which had received antivenene serum, death occurred in from 6 to 60 hours.

My thanks are due to all those doctors who have kindly supplied me with reports of their unpublished cases of adder-bite; also to many bitten persons who have supplied data otherwise unobtainable.

Medical Memoranda

Allergy to Moulds in England

In a paper on moulds and asthma (Fraenkel, 1938) I compared skin reactions to a mixed mould extract from *Penicillium*, *Aspergillus*, and *Mucor* types of moulds in Germany and in England. It was found that 16% of the asthma patients tested in Germany gave positive reactions to this allergen, whereas asthmatics tested in England gave 53% of positive reactions to the same mixture.

It has become evident from the American literature on mould allergy that regional differences in the incidence of positive reactions to moulds have been observed in the U.S.A. Balyeat found in Oklahoma positive reactions to moulds in only 1% of his patients; 12.2% were obtained in Los Angeles by Lamson and Rogers. They used extracts supplied by the Arlington Company, made up from four types of *Aspergillus* and of one type each of *Alternaria, Chaetomium, Monilia, Mucor,* and *Penicillium*—in all, nine different types. Feinberg, in Chicago, obtained 28% positive reactions towards one or more of several fungi.

Another paper was published by Schonwald from Seattle, and this author observed that 77% of his patients gave positive results to one or the other of 10 types of moulds. Schonwald stressed the point that there is a far more abundant growth of moulds in Seattle, with an average humidity of 85% in the morning and 51% in the evening, compared with average humidities of 42% and 27% respectively 300 miles inland. These facts explain the great part played by moulds in the aetiology of asthma in this district of the United States. His views were confirmed by the success of desensitization treatment with mould extracts in 86 patients.

The moulds are an important factor in hay-fever and in asthma because of the abundance of mould spores in the atmosphere and because, being much smaller than grass pollen, they are more easily inhaled and absorbed. They are present indoors and out of doors, particularly in a damp climate like that of England, and in many cases are probably responsible for the fact that an allergic patient is ill in one particular district, house, or room. Mould-infested beddings, feathers, mattresses, or even kapok can become the cause of asthma or other allergic

complaints, just as the *Cladosporium fulvum* Coke on decaying tomato plants causes asthma in gardeners, or moulds in cheese cause other allergic irritations.

These observations seemed sufficient reason to study allergy to moulds in this country more closely. In my first investigations I was aided by Miss Frances Stephens, of the Natural History Museum Department for Mycology. I learned that there are probably more than 1,200 different types of moulds to be found in this country, and that culture of moulds, identification, and classification are often not easy (Fraenkel, 1939). The task is not made easier by the fact that they are able to form cross-breeds, with apparently new characteristics.

Out of that abundance of moulds it seemed advisable to choose for further investigations those which were likely to be most important as allergic factors. It was presumed that moulds which were found in closest contact with the body of allergic patients would probably be more important than others. In 40 cases of allergy, mostly asthmatics, but also cases of vasomotor rhinitis (including hay-fever), of eczema or urticaria, and of migraine, moulds were cultured from the patient's environment (dust, beddings, etc.) and excretions (sputum in asthma, nasal swabs in rhinitis, and faeces in skin cases). In a great number of cases identical moulds were found in both excretions and environment. Extracts of these were used for skin tests in the patient, and where these gave positive reactions the allergens were also employed to desensitize him. Pure cultures of moulds and extracts were kept in stock. The results of this method were encouraging, but the number of patients examined and treated was too small to justify final conclusions. A great deal of material and of assistance was required for the mould cultures, and I wish to thank Mr. F. R. Hackett, of the Southern Group Laboratory, for the help he gave me in this investigation. In the course of the war it became increasingly difficult to carry on the investigations when work of greater importance had to be given preference. It was therefore decided to use the six types of moulds most frequently found in our allergic cases as stock allergens for skin tests and for desensitization.

180 allergic cases have so far been tested with these six types of moulds, which had been isolated from the environment and from the excretions of allergic patients. Of these, 120 were asthmatics, 30 were cases of vasomotor rhinitis (including hay-fever), and the others cases of urticaria, eczema, and migraine. The first 100 cases of asthma were evaluated statistically, as the number of other cases so far examined was considered too small for such purpose. They have all been subjected to scratch tests to allergens from the following types of moulds and to a mixture of these in equal parts: (1) *Sporotrichon*, (2) *Cladosporium*, (3) *Penicillium*, (4) *Aspergillus*, (5) *Mucor*, (6) *Monilia*.

Table showing Results of 100 Cases of Bronchial Asthma tested with 6 Types of Moulds

	Positive (%)	Negative (%)
With mould mixtures ..	66 (++14; +52)	34 (±6; −28)
„ Sporotrichon	65 (+++1; ++25; +39)	35 (±6; −29)
„ Cladosporium	53 (+++2; ++19; +32)	47 (±5; −42)
„ Penicillium	44 (++8; +36)	56 (±4; −52)
„ Aspergillus	39 (++9; +30)	61 (±5; −56)
„ Mucor	40 (++12; +28)	60 (±5; −55)
„ Monilia	31 (+++1; ++8; +22)	69 ±4; −65)

The mould mixture gave the most frequent positive reactions, as could be expected; next to it came *Sporotrichon* types, with 65%, and *Cladosporium*, with 53%. Of the cases examined 44% gave positive reactions to *Penicillium*, 40% to *Mucor*, 39% to *Aspergillus*, and 31% to *Monilia* types.

The results obtained are very near to Schonwald's figures as reported from Seattle, the geographical position of which on the American continent is similar to that of England in Europe. It can be presumed that climatic conditions, especially humidity of the air, dampness of the ground, and consequently growth of moulds, are also somewhat similar.

From these observations it may be justifiable to draw the conclusion that allergy to moulds cannot be neglected in the examination and treatment of asthmatics or other allergic patients in this country.

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Reviews

PREVENTION OF VENEREAL DISEASE

The Prevention of Venereal Disease. By L. Martindale, M.D., B.S., F.R.C.O.G. (Pp. 74. 2s. 6d.) London: Research Books, Ltd. 1945.

This little book is presumably written mainly for the general public, but it should also prove of interest to social service workers. The first part is devoted to an account of the three main venereal diseases, their symptoms, diagnosis, and treatment; the author makes the common mistake of stating that cold may kill the gonococcus, the very doubtful statement that syphilis can be transmitted to the 3rd and 4th generations, and slips up when she says that gonorrhoea is treated with penicillin for a total of 60 injections in 7½ days. Part II includes chapters on earlier experiments in legislation, an account of the success of the clinic system in Great Britain, war and legislation, notification, what Russia has achieved, and a final chapter on conclusions to be drawn. There are four appendices—the report of the Trevethin Committee, notification and compulsory treatment in various countries, a list of V.D. clinics in Great Britain (which incidentally is not up to date), and the Oath of Hippocrates.

Few will quarrel with the theme that runs through the book—that continence is the one sure way of avoiding V.D., that the problem is a moral, just as much as, or possibly more than, a medical one, and that education of the public to make it V.D.-conscious should be the main plank in the anti-V.D. platform. Miss Louisa Martindale is a stout opponent of any form of compulsion, and has nothing good to say for Regulation 33B, which, however, has hardly been the failure she would suggest if account is taken of the results of acting on a single notification. Recommendations include sex instruction, cleaner films and a higher standard of literature, better housing and living conditions, healthy recreation, improved treatment facilities, and more almoners; nothing is said about case finding, which has given very good results where it has been undertaken with energy and tact.

SETTING A COURSE FOR CONDUCT

Thoughts, Deeds and Human Happiness. By K. W. Monsarrat. (Pp. 123. 7s. 6d.) Liverpool: The University Press. 1944.

Three years ago Mr. Monsarrat published *My Self, My Thinking, My Thoughts*, which was an analysis of self-expression. In the present volume he further examines human view-forming powers and habits—a design for living and how and by what action the social desires and aspirations of men may be fulfilled. In his introduction he refers to the present war as employing the greatest number of men that the nations can muster, and all the means that ingenuity has devised and industry can produce to kill or maim each other. Always there have been men who have been antagonists of their own kind and have chosen the robbing of others of their lives or of their chances of happiness as a means for contriving their own advantage. Mr. Monsarrat says: "It is not certain that the human race is inevitably condemned to recurring orgies of mutual torture and murder, but it is certain that it will have to find a new way of living wholly different from that which has been its habit, coupled with new views, valuations, and beliefs, if it is to escape them."

Each of us desires his own stability and prosperity; the only way to ensure this is by giving these benefits to others, supplying their needs and adding to their wealth. In developing his thesis of a design for living (albeit with some tautology) the author stresses that the effort by men to acquire good states *for themselves* always brings them to the brink of social ruin. Most of the book is occupied with the question of planning what we desire and the best principles of behaviour. There is a good chapter on self-expression and the means to understanding. Sense and intelligence are the keynote of this book—the word "sense" being used for that ability which gives a man a "view" or picture, and the word "intelligence" for his habit of interpreting his "views" in terms of actions that have brought about what the views show. The volume is thought-provoking and contains the foundations for believing in and following the right course of human conduct. It is, after all, a scientific enunciation of the Christian doctrine.

SURGICAL ERRORS AND SAFEGUARDS

Surgical Errors and Safeguards. By Max Thorek, M.D., LL.D., F.I.C.S. With foreword by Sir Hugh Devine, M.S. And a chapter on Legal Responsibility in Surgical Practice by Hubert Winston Smith, M.D. Fourth edition, completely revised. (Pp. 1,085; illustrated. 90s.) London: J. B. Lippincott Company.

This book by Max Thorek is now very widely known; the present, fourth, edition is enlarged to well over a thousand pages, and, as the author says, is a "compendium of the experiences of surgeons throughout the world" instead of being in the main a guide derived from personal experiences. As a result the work is more valuable and considerably expanded.

To those who are not acquainted with the scope of this work it should be pointed out that the title is a little misleading in that it is much more than a mere recital of the pitfalls of operative surgery; many operative procedures are fairly fully described, and there is an abundance of information upon the value of diagnostic signs and symptoms. Indeed it might almost be considered to be a textbook of surgery, laying emphasis upon the mistakes which may be made.

The book is well produced, and the illustrations, nearly 800 in number, are of the excellence usually associated with Thorek's writings. When reviewing the original edition we drew attention to the unfortunate use of certain expressions which, while probably well recognized in the United States, are not understood elsewhere. The particular instance which we then picked upon—"Do not operate upon cases of frozen pelvis"—still remains in the text, and although thirteen years have elapsed we still do not know what it means. The volume, however, is one which can be strongly recommended for the perusal of the surgeon, be he young or old, about to deal with a type of case in which he is not as yet very experienced; it can be relied upon to have the chastening effect which is the author's aim.

Notes on Books

Welfare in the British Colonies, by L. P. MAIR, is published at 5s. by the Royal Institute of International Affairs (Chatham House, St. James's Square, London, S.W.1). This study of our various Colonial welfare services describes how the aims of social policy are put into practice. Education, labour, and health are the three subjects for which the Colonial Office employs specialist departments. Africa, Malaya, Hong Kong, the West Indies, and the Western Pacific Islands are the far-flung spheres, and the work done in one reacts upon that in every other. Great problems have had to be faced. This booklet shows that none are insoluble and that wonderful work is being done to adjust vast native populations to modern conditions. An all-round increase of welfare must greatly depend on improvement of health conditions, especially in the Tropics, where parasitic infections are much more prevalent than in Europe and have widespread debilitating effects. It is now recognized that the apathy and lack of initiative of Colonial peoples are much more likely to be due to their physical condition than to any quality inherent in their character, and emphasis is now shifting from the curative to the preventive aspects of tropical medicine. This calls for the co-operation of all experts in the tropical field. Mr. Mair has compressed into small compass a great deal of useful information that will give good guidance to intending Colonial medical officers.

Convalescence often passes through two phases; the first is pleasant to the patient, who daily feels progress is being made without effort or responsibility on his part. But as this rate of progress slows down, and the patient becomes less "interesting" to his attendants while having to revive his own resources, a period of disappointment is apt to ensue. It is with the treatment of this second phase that Miss SHEILA PIM'S perceptive little book *Getting Better* (Faber and Faber; 6s.) deals; it is mostly addressed to the convalescent himself, and is full of useful hints of methods to avoid boredom and facilitate recovery, adapted to all grades of intelligence.

The shortage of nursing and domestic staff in tuberculosis institutions has prompted the Ministry of Labour and National Service to reissue for general circulation a small pamphlet, *The Healing Touch*, originally compiled by the National Association for the Prevention of Tuberculosis. This is designed to encourage recruitment for sanatorium nursing.

Correction.—Two mistakes appeared last week in the notice of the fourth edition of Dr. W. GORDON SEARS'S *Medicine for Nurses*. The publishers are Messrs. Edward Arnold and Co., and the price is 10s.

Preparations and Appliances

APPARATUS TO ELEVATE A FRACTURE CASE FOR APPLICATION OF PLASTER

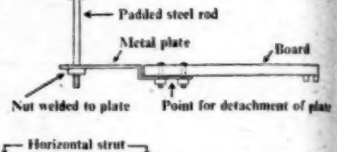
Fl. Lieut. J. NOEL-JACKSON, M.B., B.S., writes:

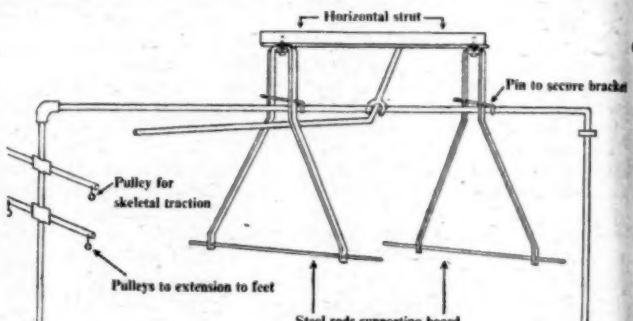
During the snowstorm in March, a man aged 76 fell near his home in an isolated village. On examination there was deformity of the left thigh and marked shortening. His condition of grave shock precluded the uncertain journey to hospital. The village was virtually cut off by the appalling weather and no appliances were available.

A Thomas splint was fashioned from steel rod and welded in a garage near by. Skin traction was applied and the patient put to bed. The general condition did not improve, and it was apparent that he required a more comfortable extension. A form of ice-tong calliper was designed. This had to be extremely simple because it had to be made without special skill. It consists of two pieces of 5/16-in. section steel rod tapered to a point at one end, flattened for 1 in. at the middle and at the other end, where a hole was drilled through it. Both were then bent to form a modified "S" as in the diagram. The two halves were then bolted together.

A Braun frame was made from steel strip, and skeletal traction fitted up. Application of a plaster cast without releasing the extension was the next problem.

A Morison gas-pipe frame was made up of 1½-in. steel tubes. Two inverted "V" brackets were made. These were to fit over the overhead beam of the frame suspending the patient clear of the bed. The brackets supported a board slipped under the patient's back. Horizontal cross-pieces were bracketed to the upright of Morison's frame to take pulleys for extension. When it was decided to apply a plaster cast the first step was to slip a flat board under the patient's back. This extended from the head to the level of the second lumbar vertebra. A metal plate was bolted to the lower end of this board. This plate could be detached from the board by unscrewing four nuts.





The "V" brackets were then fitted to the overhead beam. Two steel rods were slipped under the board and through holes drilled through the lower end of the brackets. The extension was transferred from the Braun frame to a pulley on the upper horizontal cross-piece. The Braun frame was then removed and traction applied to both feet over pulleys at each end of the lower horizontal cross-piece.

A padded steel rod threaded at the lower end was screwed into the metal plate to provide counter-extension in the groin. The upper ends of the brackets were connected by a horizontal strut. A lever applied near the middle of this lifted the patient clear of the bed.

As the application of the cast proceeded the skeletal traction was removed. It should be observed that without the support of the Braun frame the leg took up an attitude of extension at the knee-joint due to the weight of the leg. Finally the patient was lowered, the board was detached from the metal plate by unscrewing four nuts, and the board slipped out sideways. The metal vertical rod was unscrewed from the metal plate and the latter withdrawn by pulling it upwards. Extension to the feet was removed.

The entire apparatus was designed to meet a novel and unforeseen emergency, and it is worth recording only because the entire apparatus was made with materials available almost anywhere. A skiagram taken some weeks after the injury shows an oblique fracture through the greater trochanter of the femur. Union is poor but apposition is excellent. The poor bony union vindicates the precautions taken to ensure continuity of extension, but the position achieved at least favours union and avoids shortening, and the patient is now walking about.

I am indebted to Mr. Exton, of Wheatcroft, for the incredible promptness with which the apparatus was reproduced from my brief drawings.

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THE ORGANIZATION OF THE MEDICAL PROFESSION IN WARTIME

We are privileged to print in this week's issue at page 22 a letter from the Minister of Health (Mr. Henry Willink) paying generous tribute to the work of the Central and Local Medical War Committees during the past six years. We are sure that the members of these committees and the profession generally would like us, in response, to acknowledge the friendly and helpful spirit of co-operation not only of Mr. Willink and his predecessors in office but also of the other Ministers, Government Departments, and the fighting Services who have needed and used the service of the profession throughout the war. During these strenuous years many things have been done, often under a shroud of secrecy, which easily slip the memory, and it may therefore be appropriate at this time to recall some of them.

As far back as 1925 the Council of the British Medical Association, actuated by its experience of the war of 1914–18, prepared a confidential memorandum on the machinery for dealing with the recruitment of medical practitioners in case of war, and set up Emergency Committees for England and Wales, Scotland, and Northern Ireland. These committees were kept in being and became active in November, 1936, when the clouds were beginning to gather over Europe. The committee for England and Wales was then reconstituted on a wider basis. Its first task was to circularize all members of the profession in order to ascertain what service at home or abroad each would be ready to give on the outbreak of war and before compulsory service might be imposed. Local medical emergency committees for each Division were established, and local emergency officers were appointed whose first function was to ensure completion and return of the questionary. In this way a register of the profession was compiled and maintained at headquarters, with copies of its local parts in the possession of each divisional emergency officer. By the spring of 1938 information was available as to 75% of the profession in Great Britain and Northern Ireland, according to their ages and types of practice. After the Munich crisis in the autumn of that year the percentage rapidly rose to 95, and it reached 98 in the early days of the war. This register, constantly revised, has been the foundation of the work of the committee.

The crisis of 1938 exposed some defects in the organization for effective mobilization of the profession. The information at the disposal of the committee was found to be insufficient to enable it to bring the medical services quickly into action in appropriate directions. In particular Government Departments and local authorities, who were the local agents for civil defence, appeared to have different ideas as to the medical staffing of their units, including first-aid posts; no definite understanding had been reached with the hospitals; further, there was no central or local information as to which areas had been assigned for the reception of evacuees. It was evident that the central and local committees could not successfully fulfil their task until their position as agents of the Government for the allocation of medical man-power was more clearly defined. Representations were accordingly made to the Government urging it to bring all medical services for civilians under one control, to co-ordinate them with the medical departments of the fighting Services, and give the emergency committees authority, in consultation with the Government organization, to allocate medical personnel to the various services in time of emergency. These views were largely accepted, and the wider responsibilities of the committees called for their further reconstitution. The Central Emergency Committee was greatly enlarged so as to include every important branch of medicine and remove any suspicion that its representatives were exclusively members of the British Medical Association. It became, in effect, an independent medical body responsible to the Government, although that part of its cost which was not refunded by the Government continued to be borne by the Association. Local emergency committees were made similarly elective by the whole profession in each Division.

When war broke out in September, 1939, the emergency committees became the Central and Local Medical War Committees, and their status had been fully recognized. The Emergency Medical Service and the schemes for civil defence and evacuation were well advanced. The immediate requirements of the fighting Services and the names of those with Service commitments were known. The central and local committees had been in active collaboration with the authorities in making the arrangements, and each member of the profession knew what calls would be made upon him. It was convenient also for the local committees to undertake for the Association and in collaboration with local insurance committees the administration of the Protection of Practices Scheme. A close working relation, by cross-representation and a common secretariat, had been attained with a Committee of Reference established by the Royal Colleges at the request of the Government for the placement of men of specialist or near-specialist rank in hospitals within the area of London County. Under these conditions the mobilization of medical personnel was achieved with the minimum of disorganization.

The burden borne by the medical war committees has been heavy. In the first year of the war, indeed, the staff of the British Medical Association could scarcely have carried it but for the temporary suspension of most of the Council and nearly all the normal committee activities. Inevitably changes of method had to be made in the light of experience. The anticipated casualties from air raids did not happen, and the Central Medical War Committee, in conjunction with the Committee of Reference, had to draw the Government's attention to the disbalance which the originally approved hospital scheme was causing among specialists, especially in London, where whole-time service had been extensively adopted. The system was then modified and guided from time to time by an Advisory

Emergency Medical Service Committee of the main committee, with direct access to the Minister of Health. This committee has been continuously watchful of the terms and conditions of service of consultants and specialists.

The bulk of the work of the Central Medical War Committee has, however, fallen upon its Services Committee and, for a time, upon the Young Practitioners Subcommittee, which dealt directly with the recruitment of recently qualified men and women without local attachment. With the institution of compulsory service the Services Committee became the central tribunal for the medical services. It has functioned in close association with Local Medical War Committees, Government Departments, the fighting Services, and all manner of bodies employing medical officers in such a way as to hold the unsteady balance between their several needs. Their demands have not always appeared to be synonymous with their needs, and it has been this committee's delicate task to sift the claims of bodies and individuals and arrive at a conclusion as to whether civil needs were such as to render recruitment or direction inadvisable. But, while it has been able to manipulate the pool of civilian doctors, usually with the help of local committees, occasionally against their representations, it has not been in the position to influence directly the demands of the fighting Services, although the presence on the committee of the representatives of these Services may have brought home to them from time to time the distressing state of civilian practice. In 1940 the unabated calls of the Services caused such concern that the Government was asked to look into them, and accordingly a special Government committee was set up, consisting of civilian and Service members under the chairmanship of Sir Arthur Robinson. This committee sat almost continuously for a fortnight, and, while its findings were not disclosed, one of the results was the establishment of the Medical Personnel (Priority) Committee under the chairmanship of Sir Geoffrey Shakespeare, M.P., which met the request of the Central Medical War Committee for a permanent wartime committee to scrutinize Service as well as other demands for medical officers and determine specifically the number to be recruited from time to time.

The volume of work of the Services Committee has not diminished. The multifarious matters coming before it and the local committees are infinite in their variety and complexity. Toward the end of the European war fewer medical officers have been recruited, but civilian needs have had to be met by a profession weakened by the attrition of age, retirement, ill-health, and death. In spite of repeated appeals the public have been unable to limit their calls on practitioners to a level within the capacity of the depleted profession. Each case of recruitment has therefore become an increasingly difficult problem. The requests, too, for the release of practitioners from the Services because of local or other special predicaments have grown in number, and the study of each of these and of its repercussions has been difficult and time-consuming. More recently the Central Medical War Committee has been engrossed in the problems of demobilization, as the letter to practitioners on service recently published in the *Journal*[1] has indicated. It may be noted that this question of demobilization was before the Central Emergency Committee at its meeting of October 1, 1937, and has been kept constantly in mind ever since.

Those who have experience of the conduct of committee business and who have seen the Central and Local Medical War Committees at work must have been struck with the care the members have devoted to the consideration of the mass of detail presented to them, with the efficiency of their action, and with the courtesy they have extended to those who have come before them. It will be some reward for their labours and a comfort in carrying out their unfinished tasks to know how much their work has been appreciated by the Minister to whom they have been responsible.

[1] *Supplement* to the *British Medical Journal*, May 26, 1945, p. 95.

VITAMIN C AND THE GUMS

The swollen, soft, spongy, and haemorrhagic gums of scurvy respond rapidly to treatment with vitamin C, but there is much doubt about the part played by vitamin-C deficiency in the aetiology of inflammatory conditions of the gums seen in general medical and dental practice. A careful clinical examination should always be made of a patient with swollen and bleeding gums before vitamin-C deficiency is diagnosed, as the gum lesion may be a manifestation of a haemorrhagic condition. It is recorded that four cases of uraemic toxaemia with bleeding gums were once diagnosed as cases of vitamin-C deficiency.[1] Kruse[2] states that the macro- and micro-scopical examination of the gums affords a simple and objective method of detecting vitamin-C deficiency. The sites affected are stated to be involved in a definite order: interdental papillae, the marginal gingivae, and then the alveolar gingivae. Kruse describes vascular engorgement as the first stage, followed by swelling of the gums around the neck of the teeth. If the condition is untreated it becomes chronic, when the swelling is masked by oedema, which causes the gums to look pale. Finally, atrophy of the gums occurs, the dental papillae recede, and the teeth become loose. According to Kruse, these changes are reversed by vitamin C, but his observations conflict with those of Crandon[3] and of Farmer.[4] After six months on a scorbutic diet Crandon failed to observe any pathological changes in his gums, although the vitamin C in the white cell layer was zero. This was confirmed by Farmer and his colleagues, who kept volunteers on a scorbutic diet for many months but failed to observe any pathological changes in the gums, teeth, or bones of the jaw as seen with the naked eye, or by means of the biomicroscope and *x* rays: as in Crandon's case, the level of vitamin C in the white cell layer was zero.

In spite of these careful observations many workers have claimed that gingivitis alone is indicative of vitamin-C deficiency, and there are several reports on the beneficial effects of prescribing fruit juices or synthetic vitamin C. Vitamin-C deficiency, as evidenced by low excretion values or plasma levels, has also been recorded in patients with such conditions. Much of this work was uncontrolled,

[1] Wright, F. J., *East Afr. med. J.*, 1944, **21**, 146.
[2] *Milbank mem. Fund Quart.*, 1942, **20**, 290.
[3] *J. Amer. med. Ass.*, 1941, **116**, 663; and *New Engl. J. Med.*, 1940, **222**, 748; 1940, **223**, 353.
[4] *Federation Proc.*, 1944, **3**, 179.

and as local treatment was also often carried out the effect of the vitamin C was difficult to assess. As pointed out previously in these columns,[5] urine tests and estimations of vitamin C in the plasma are of doubtful value for the detection of vitamin-C deficiency. More recently a number of workers have failed to find any significant relation between the intake of vitamin C and the incidence of gingivitis. Burrill,[6] from observations on 1,400 patients, noted that, although a large number of subjects with low vitamin-C levels in the plasma had gingivitis or periodontal disease, the correlation was not close enough to suggest any causal relation. He believes that a patient likely to neglect his mouth will also neglect his teeth; in other words, vitamin deficiency and periodontal disease may have the same origin, although they are not related aetiologically. MacDonald[7] noted a high incidence of bleeding gums and gingivitis among British naval ratings, but he was unable to show that it was related to vitamin-C deficiency, and the condition cleared up with local treatment. Similar observations were made by Ungley and Horton.[8] Local conditions, such as infection and tartar, were sufficient to account for the unhealthy gums which did not respond to treatment with vitamin C. In a carefully controlled study of nearly 3,000 R.A.F. personnel Stamm, Macrae, and Yudkin[9] found that 20% of them suffered from bleeding gums; vitamin C and the inert control tablets were equally ineffective in treatment.

A high incidence of vitamin-C deficiency has been reported in subjects in the British Army and Navy suffering from ulcerative gingivitis[10] (ulcerative gingivo-stomatitis, Vincent's disease, "trench mouth"). But it is doubtful if it is directly related to vitamin-C deficiency, as it responds to local treatment alone, although some workers claim to have obtained the best results by local treatment combined with vitamin-C therapy. Pincus[11] and Williams[12] found no evidence of vitamin-C deficiency in a number of subjects suffering from ulcerative gingivitis, and vitamin C appeared to have no curative action. The chief factor in the spread of ulcerative gingivitis is probably contagion, due, for example, to dirty oral habits, unclean crockery, and a particular variety of kissing. It is conceivable that vitamin-C deficiency may result in lowered resistance of the gums to infection—although this is difficult to prove, and is certainly not borne out by the work of Crandon and of Farmer—but once the patient has ulcerative gingivitis large doses of vitamin C are ineffective in curing it.

These conflicting views on vitamin C and gingivitis are undoubtedly due to confusion over the aetiology and symptomatology of inflammatory conditions of the gums, the absence of established standards for the normal, and the lack of controlled observations by earlier workers. It is quite likely that there are three clinical entities: (1) scorbutic gingivitis, which must be relatively rare in this country, usually appears after other scorbutic symptoms, and responds to vitamin C; (2) ulcerative gingivitis, or Vincent's disease, which is primarily infective, is not related to vitamin-C deficiency, and is not cured by vitamin C; and (3) non-specific gingivitis, characterized by swollen, bleeding gums, which is common in the population at large and is unaffected by vitamin-C therapy.

[5] *British Medical Journal*, 1945, **1**, 600.
[6] *J. dent. Res.*, 1942, **21**, 353.
[7] *Lancet*, 1943, **2**, 697.
[8] Ibid., 1943, **1**, 397.
[9] *British Medical Journal*, 1944, **2**, 239.
[10] Stuhl, F., *Lancet*, 1943, **1**, 640; Buchanan, J. W., *J. roy. nav. med. Serv.*, 1943, **29**, 249.
[11] *Brit. dent. J.*, 1943, **75**, 309.
[12] *J. roy. nav. med. Serv.*, 1943, **29**, 115.

TOXICITY OF SALICYLATES

E. K. Marshall's teaching on the importance of maintaining a steady concentration of sulphonamides in the blood has not been without effect. Much of the recent work on mepacrine has been based on the idea that to suppress clinical malaria one must maintain a certain concentration in the plasma, and now Coburn[1] states that a concentration of sodium salicylate greater than 36 mg. per 100 c.cm. is necessary for the effective relief of the symptoms of acute rheumatic fever. To obtain this high concentration the dose must be between 10 and 20 grammes per day—that is, from 150 to 300 grains. The usual dosage in this country is 8 grammes, or 120 grains, a day. Very high doses have resulted in toxic effects which were previously unknown. The most striking is a fall in the amount of prothrombin in the blood. Thus in a case reported by Fashena and Walker[2] the bleeding time was 5 min. 30 sec., the clotting time 10 min., and the prothrombin time 2 min. 45 sec.—"a value more than five times the normal, which connotes almost complete absence of circulating prothrombin." That the fall in prothrombin was due to salicylates has been proved by Link and his colleagues,[3] and also by Rapoport and Guest,[4] who observed it when they gave salicylates to rats and rabbits. In this connexion we may recall the late Sir Arthur Hurst's observation of the frequency of haematemesis in patients with gastric ulcer if they were given aspirin (acetylsalicylic acid). There can then be no doubt that salicylates will reduce the patient's prothrombin and decrease the power of his blood to clot. Does this matter? Is diminished coagulability of importance clinically? Apparently it may be. Ashworth and McKemie[5] have recently observed two deaths from haemorrhagic encephalitis in which salicylates appeared to be the lethal factor. The danger from diminished prothrombin can fortunately be removed by the simple expedient of giving the patient vitamin K or a related substance such as menaphthone (*B.P.*). Shapiro[6] has estimated that 1 mg. synthetic vitamin K will counteract the effect of 1 gramme (15 grains) of acetylsalicylic acid. No doubt the regular use of menaphthone together with salicylates will gradually become established.

There are other effects of salicylates, which Sable[7] considers in a recent review. Sometimes there is severe hyperpnoea, which is thought to be due to stimulation of the respiratory centre; the respiration has been found to increase from 5 to 37 litres per minute. This can be treated only by withdrawing salicylates, when the hyperpnoea subsides in 48 hours. Salicylates like aspirin may lead to an allergic condition in which there are asthma or dyspnoea, urticarial wheals, and subcutaneous oedema. These clear up when adrenaline is injected. The best-known symptoms of toxicity are nausea, vomiting, tinnitus, and partial deafness. These have been widely studied in the past, and have furnished those who teach pharmacology with a striking example of the variation which exists among patients in their sensitivity to drugs. As long ago as 1913

[1] *Johns Hopk. Hosp. Bull.*, 1943, **73**, 435.
[2] *Amer. J. Dis. Child.*, 1944, **68**, 369.
[3] *J. biol. Chem.*, 1943, **147**, 463.
[4] *Proc. Soc. exp. Biol.*, N.Y., 1943, **53**, 40.
[5] *J. Amer. med. Ass.*, 1944, **126**, 806.
[6] Ibid., 1944, **125**, 546.
[7] *Canad. med. Ass. J.*, 1945, **52**, 153.

Hanzlik showed that in some men toxic effects occur after as small a dose as 40 grains of sodium salicylate, whereas others could take as much as 460 grains. Usually symptoms appeared after a dose of 190 grains.

GOING HOME

All over Europe the war-exiled are making for home, hungry for the familiar setting from which they were uprooted. For many there will be great happiness in reunion; for others the bitterness of loss, human and material; for all there must be in some degree the Rip van Winkle shock of realizing that neither for themselves nor for their families has Time stood still, so that the days of long ago can never be repeated. In its wisdom the Ministry of Health has recognized that a domestic problem of this kind arises with regard to the evacuated children now returning to their homes. A circular addressed to county and county borough councils and welfare authorities in the Metropolitan evacuation and other "return home" areas describes the kind of rehabilitation difficulties likely to occur, and gives advice on how these can be ameliorated. It is a very human document, stressing such homely points as the mother's possible disappointment at finding that the "baby" she cosseted is now a self-reliant school-child, anxious to stand on his own feet—or the opposite problem of the ex-baby's jealousy of the younger brothers and sisters born during his absence. It is noted that the change from billet to home almost inevitably means a change of standards: some evacuees may have grown accustomed to better social conditions, others to less care and comforts; in either case the imagination of childhood may well result in stories of Princess- or Cinderella-like experience, disturbing to parents who have not visited enough to judge for themselves and so add the requisite grains of salt to these fantasies. Country habits, too, may be hard to abandon in town, where "picking flowers becomes stealing . . . going for a walk can easily turn into 'wandering,' and climbing trees into 'wilful damage'"; though the adaptability of children and the common sense of authorities probably make this problem less important than others. For those who have grown attached to their foster-parents the question of divided loyalties may be a troublous one, accentuated by the contrast between dream pictures of the perfect home, so naturally built up by wanderers, and the imperfect, because human, reality. There may be, for those who have been fortunate in evacuation experience, a revulsion of feeling towards home, and a desire to go back to the foster-home, which in its turn may be glorified by absence.

There are also the special problems of those children who have been in hostels or residential war nurseries. These have been living as members, not of a family, but of a community planned and run for their benefit, usually in groups of their own age. They have as a rule become accustomed to high standards of physical well-being, but inevitably their opportunities for acquiring independence and resource have been limited. Many of those who return from nurseries will have forgotten, while others have never known, what life in a family is like. They have missed the normal experience of mixing with older and younger children, and may also be unused to the common risks of a household, such as boiling kettles, unguarded fires, or to the dangers of road traffic. Perhaps more important still, they are unused to parents except as visitors laden with gifts and free to devote all their time to their offspring. To smooth over the transition period it is suggested that home visits shall be arranged immediately after the return of children by welfare and education authorities, that teachers should encourage parents to consult them, and that the aid of such children's organizations as Scouts, Guides, clubs, and play-centres should be invoked. For children showing signs of special disturbance reference to the school medical officer and to child-guidance clinics is advised. The potential value of health visitors' friendly advice to mothers is rightly stressed in relation to ensuring continuity of good routine and diet for the under-fives. To sum up, this circular seems a notable example of planning for health, mental and physical, and should do much to safeguard at home the children whom the Ministry has so long and carefully shepherded on their wanderings.

NARCOLEPSY AS NEUROSIS

The work of Adie, Brain, Kinnier Wilson, and others has shown that narcolepsy may occur as the result of a lesion of the hypothalamus, or as an idiopathic state. In the majority of cases no cause for the condition can be discovered. Since the syndrome was first described by Gelineau in 1880, the frequency with which it is diagnosed has increased very much, particularly in latter years. Up till now it has always been looked on as due to physical states, probable related in nature to the causes of idiopathic epilepsy. The suggestion has now been made by Langworthy and Betz[1] that it may occur as a neurotic syndrome. These authors describe in detail the psychiatric background in two cases of narcolepsy which they have personally observed. They also review in psychiatric terms the available history of four further cases which had been previously investigated along laboratory lines by Levin.[2] In their opinion the data indicate that the syndrome arose in these cases in a situation of conflict, and in men and women whose personalities were incapable of a healthy resolution of the conflict; the illness represented a flight from the situation and a solution along neurotic lines. They point out that hysterical or hypochondriacal patients may suffer from somatic symptoms, such as precordial pain and palpitation, and nausea, anorexia, and diarrhoea. Narcolepsy, in this view, would represent the utilization of the nervous system to provide a defensive reaction.

The evidence so far adduced seems rather flimsy. It is not enough to show that a situation of conflict arose and symptoms of narcolepsy developed at about the same time to prove that they are causally related. Neurotic symptoms in general are symptoms which in minor degree are the common experience of man, but which occur with unusual severity in persons of predisposed constitution or in circumstances of stress. The narcoleptic syndrome is unusually clear-cut and distinctive and shows no readily comparable analogue in the normal range of experience. It is certainly related to dysfunction of the hypothalamus, and is specifically amenable to treatment by amphetamine sulphate. More evidence will be required than is here provided that the general run of idiopathic narcoleptics are suffering, as the authors suggest, from a neurosis.

THE HALF-YEARLY INDEXES

The half-yearly indexes to Vol. II of the *Journal* and the *Supplement* for 1944 have been printed. They will, however, not be issued with all copies of the *Journal* but only to those readers who ask for them. Any member or subscriber who wishes to have one or both of the indexes can obtain what he wants, post free, by sending a postcard notifying his desire to the Accountant, B.M.A. House, Tavistock Square, London, W.C.1. Those wishing to receive the indexes regularly as published should intimate this.

[1] *Psychosomatic Med.*, 1944, **6**, 211.
[2] *Arch. Neurol. Psychiat.*, Chicago, 1929, **22**, 1172.

NOTES ON A MIXED SHORT-TERM DAY NURSERY

BY

J. F. DOW, M.D.

Medical Officer of Health for the County of Westmorland

The nursery which is here described is situated in a pleasant country-house on the shores of a beautiful lake. It has a large garden, which supplies the house with vegetables; and poultry provide the nursery with fresh eggs. It was first established as a day nursery with a view to the reception of the children of women working at a large neighbouring war factory. However, the requisite number of children were not forthcoming, and in late 1943 it was amalgamated with a neighbouring nursery, which had been used solely for the reception of young children during the period when their mothers were having a further confinement. Under this new arrangement residence was provided for 21 children, and day children up to a similar number could be admitted; throughout the year the residential part of the nursery varied from 17 to, during rush periods of evacuation, 24. Day children numbered from 5 to 10.

Throughout 1944 the nursery was thus taking three different types of children: (1) There were 10 children attending daily who came into the nursery between 7.30 and 9 a.m. and left between 5 and 6 p.m. (2) There were 97 short-term children aged from 1 to 5 years who were admitted during the sickness or confinement of their mothers. These were to a large extent the children of mothers evacuated from dangerous areas. (3) There were 14 children whose mothers were employed on war work that, because of the hours or other circumstances, made it impossible for the children to be with them. It was expected, and has generally been fulfilled, that the mothers should visit these children at week-ends and keep in touch with them.

The nursery is divided into three groups: a day and night nursery for 0–1 year, for 1–3 years, and for 3–5 years. It is obvious that a nursery of this varied type presents considerably more problems than would arise from a complete day nursery or residential nursery. The constant admission of new children for only a short time creates a greater risk of infection being brought in; they enter unclean and untrained, and these difficulties are corrected only when it is time for them to leave.

The staff consists of: (1) The matron, who is a fully trained State-registered nurse. She has a position of considerable responsibility, as children are sometimes admitted at only a few hours' notice, and one must rely on her examination of the new arrival to exclude infection. Moreover, the whole character of the nursery depends entirely on her—whether the atmosphere is that of an institution or a home. (2) Two child-care reserves; two nursery assistants; and three probationers. At first sight this staff will seem excessive, but when one considers the length of the day's programme (detailed below) and also that every member is entitled to three hours off duty each day, a day off each week, and three weeks' holiday each year, I think it will be agreed that such a staff is necessary. Indeed, quite apart from the care of the children during the day, all the children's clothes and napkins, etc., are washed by the nursery staff, and only the heavy linen is sent to the laundry. The mending, marking, and ironing of all the clothes are done by the staff, largely in the evening.

The daily programme for the children is as follows:

6 a.m.—Children under 1 given milk.

6.45 a.m.—All children wakened; toilet; orange juice; wash.

7.15 a.m.—Breakfast: Porridge or corn flakes; prunes, bacon, fried bread, or fresh eggs, scrambled or poached; bread-and-butter, jam or syrup, rusks, milk.

8 to 8.30 a.m.—Toilet; wash; free play.

9.30 to 10 a.m.—Cocoa or milk and biscuits; cod-liver oil and malt.

10 a.m. to 12 noon.—Out for walk or play in the grounds, and sleep in the prams or in the night nursery; toilet.

12 noon.—Lunch: Soup or mince or fish, or cheese dish, potato and gravy, and two vegetables when possible; rice or semolina, custard and fruit (own produce bottled or fresh in season) or prunes; sponge puddings; orange juice.

12.45 to 2.30 p.m.—Toilet; wash; rest period.

2.30 to 4 p.m.—Toilet; either walk or play, or drawing; plasticine; imaginative play; nursery rhyme songs to piano. Older children love to gather leaves, twigs, and flowers for nursery.

4 p.m.—Tea: Dates and grated carrot, or shredded cabbage; fresh scrambled eggs; home-made cakes or junket, bread-and-butter, rusks or biscuits.

4 to 5.30 p.m.—Toilet—bathing and bed. Preparation of daily children for home.

9.30 to 10 p.m.—Baby-feeding and toilet.

Diet and rest for the 3–5 year children are the same as for the 1–3 year group. The older group has more constructive play, including chute, sand-pit, and swings; and songs and dances to the piano; also, their walks are taken in the surrounding woods and field, and to a near-by farmyard. Their bedtime is 6.15 p.m., after bathing.

Infectious Diseases

During the year all the children had chicken-pox, and many had rubella; in both instances the infection was traced to a day child. Three of the young staff were also affected by the latter disease. One child was admitted and discovered to be in an advanced stage of whooping-cough, but all the children were at once immunized and there was no further case. Every one of them has, of course, been immunized for diphtheria. These infections were of a mild type, and gave rise to no complications. During the whole year there was no other case of sickness necessitating the children being kept in bed, and the general standard of health was excellent. During the first few days of admission a child is fretful, and generally needs up to 48 hours to settle down; this also is a period of extra work for the staff, and may account for the fact that the short-term residents do not gain weight in proportion to the permanent ones.

The day children vary in age from 2 to 5 and also in the length of time they attend. They all gained weight, to an average of 5 lb. 8 oz. The 97 short-term resident children aged 1 to 5 years were admitted for a period of two to seven weeks, and gained weight as follows: 1–2 years, 12 oz.; 2–5 years, 1 lb. 14 oz. The 14 permanent residents who were in the whole year gained weight as follows: 0–1 year, 16 lb. 4 oz.; 1–2 years, 7 lb. 9 oz.; 2–3 years, 6 lb. 14 oz.; 3–5 years, 7 lb. 8 oz.

Conclusions

The nursery has really been fortunate in avoiding the more serious types of infectious diseases, and was even unaffected by the influenza epidemic. This result may be in some way due to the fresh-air policy, but it must be admitted that the risk of such infection is very great. As a short-term nursery for children of mothers who were being confined in our maternity home or had been taken suddenly ill, it has been exceedingly useful. It has been invaluable in dealing with the children of the group of London expectant mothers who were evacuated to this district in the summer.

The improvement in weight, health, and general condition of the whole-time resident children is most gratifying. One satisfaction has been that nearly all the mothers have kept in touch with their children and helped so far as was possible. It is of course open to argument whether mothers of children of these ages should work; personally, I am not convinced that children under 2 years of age should be away from the mother. However, there are certain reasons during wartime, and in the cases of illegitimacy, where this course seems essential.

Finally, I would stress that the success of a nursery depends to a very great extent on the matron. She must be given responsibility and be trusted to run her nursery without undue interference; her success will depend as much on her motherliness as on her nursing skill. Our matron was the widow of an R.A.F. casualty, and had her two children in the nursery. These children received the same care and attention as all the others, and no more.

C. L. Steinberg (*U.S. nav. med. Bull.*, **42**, 567) in the course of five months has seen 10 cases of meningo-encephalitis in a total of 165 cases of mumps. As mumps meningitis is rarely fatal pathological reports on the condition are few, but Larkin and Gordon found congestion of the pia mater with patchy infiltration of the parenchyma along cerebral vessels.

WORK OF THE CENTRAL MEDICAL WAR COMMITTEE

MINISTER OF HEALTH'S TRIBUTE

The following letter has been addressed by the Minister of Health, Mr. Henry Willink, to Dr. Charles Hill, Secretary of the Central Medical War Committee.

My dear Dr. Hill,

Now that the war in Europe has ended I feel I must convey to the Central Medical War Committee my warm thanks for their valuable help and co-operation during the last six years. The task which the Committee readily undertook at the outbreak of war assumed a magnitude and complexity greater than could have been foreseen, but they have faced its problems and shouldered the great volume of work with a determination and efficiency which is very highly appreciated.

Their first duty was to provide the practitioners necessary for the medical needs of the Armed Forces and I well know how successfully this was achieved. It was, indeed, a positive contribution to victory. I know, too, what difficulties were entailed in meeting the demands of the Services—how the Committee had, throughout, to weigh the counter-claims of civilian needs in general practice, hospitals, public services, teaching, research and other fields. As the war lengthened and civilian medical resources were progressively depleted it could almost be said that each individual case became a problem, but the Committee could always be relied upon for a sound and fair-minded judgment in striking the balance between civil and military needs.

This was the Committee's main task. But they have also devoted much careful consideration to safeguarding the interests of serving practitioners and have had before them the claims of civilian services overseas, relief and missionary work, problems affecting aliens and a wide range of other matters. The same care has been evident in the Committe's handling of all of them.

The success of their work in meeting the demands of the Services has inevitably placed a heavy strain upon general practitioners, hospital staffs and others remaining in civilian life. Many of them have carried on under conditions of great difficulty and almost intolerable strain. I cannot allow this opportunity to pass without expressing the Government's thanks to all those practitioners, for the manner in which their burdens have been borne.

The Committee's work is not yet finished and what remains will present many new problems, but I am confident that they will meet the calls upon them with the same success as has attended their efforts in the past.

I would also ask you in your capacity as Liaison Officer to convey to members of the Committee of Reference my sincere thanks for the valuable work they have done within their special field of reviewing the hospital staffs of Greater London.

Finally I should be glad if you would let members and secretaries of Local Medical War Committees know how deeply I appreciate their contribution to this work, to which they have given voluntarily and without stint so much of their time and energies throughout the years of war.

Yours sincerely,

HENRY WILLINK.

Ministry of Health,
Whitehall, S.W.1.
June 25, 1945.

The annual general meeting of the Society for Relief of Widows and Orphans of Medical Men was held on May 23, with Dr. R. A. Young, president, in the chair. The report and accounts for 1944 were presented and approved. £5,125 was distributed in grants among the 55 widows who were in receipt of relief during the year. The total membership of the Society was 287 at the end of 1944. One widow had received £1,925 on behalf of herself and her son. Mr. W. Gilliatt was elected a vice-president, and Dr. R. R. Trail and Mr. G. T. Mullally directors. A legacy of £5,000 was received from the executors of the late Dr. Charles Reid, of Stafford. A vote of thanks was passed to the editors of the medical journals who, from time to time, publish reports of meetings of the Society. Relief is granted to the widows of deceased members whose yearly income is £125 or less. Membership is open to any registered medical man who, at the time of his election, is residing within a twenty-mile radius of Charing Cross. Full particulars may be obtained from the secretary, 11, Chandos Street, Cavendish Square, London, W.1.

CENTENARY OF ST. MARY'S HOSPITAL

The centenary of St. Mary's Hospital, Paddington, was celebrated by a Mansion House dinner on June 27, when an appeal was launched for reconstruction and extension. The scheme provides for rebuilding of the present hospital, with an increase of bed accommodation from 414 to 700, a new west block to house the out-patient and casualty departments, the fracture clinic, and the diagnostic *x*-ray department, with about 50 additional beds, and on the east side, beyond the medical school, the completion of the nurses' home, a portion of which is already built.

The Lord Mayor presided at the dinner, saying what pleasure it gave him to offer civic hospitality to a great teaching hospital which, like the other teaching hospitals, would play a large part in any future national health service scheme. Three great contemporary names were associated with St. Mary's—Sir Almroth Wright, the pioneer of vaccinotherapy, Sir Alexander Fleming, the discoverer of penicillin, and Lord Moran, in whose charge had been the health of the Prime Minister during the war years.

Mr. Brendan Bracken, First Lord of the Admiralty, said that the hospital was in the constituency which he was at the moment contesting, and it was a great refreshment to escape from the hustings to praise St. Mary's. Many institutions after a hundred years began to show distressing signs of old age, but St. Mary's remained one of the youngest of the great hospitals, alike in its work in the spheres of healing, of teaching, and of research. It was a nursery of doctors and a centre of vigorous and far-reaching investigation of medical problems. He added that whatever form the Government plan for a national health service ultimately took it would mean an even greater call on the medical profession, and so the responsibility for establishing the future health of the country rested to a great degree upon the voluntary teaching hospitals.

Lord Moran, P.R.C.P., Dean of St. Mary's Medical School, whose name was coupled with the toast of the hospital, read the following message from the Prime Minister:

"In the future health services of this country greatly increased demands will inevitably be made on St. Mary's as one of the vital medical teaching centres in this country. No hospital has a finer record of work and achievement. The discovery of penicillin by Sir Alexander Fleming has placed the whole world in its debt. It is clear from its past record that there exists in this institution an organization of exceptional worth in the field of medical education, treatment, and research. Let us, therefore, be quite sure that its work is in no way hampered by lack of proper accommodation and modern equipment. I commend most heartily this appeal to all men of good will throughout this country, our Dominions, and also to our very great friends in the United States of America. No cause could be more worthy."

Lord Moran mentioned that between the landing in Normandy and the end of the European war thousands of men had been treated with penicillin, and 95% of those so treated had recovered.

Mr. Anthony de Rothschild, chairman of the board of management of the hospital, mentioned with pride the fact that his family had been connected with St. Mary's for roughly half the century which had been completed. In a reference to some of the benefactions to the hospital he announced that King Edward's Fund for London had made a preliminary gift of £10,000. Lord McGowan, treasurer of the Inoculation Department, read a message from Field-Marshal Sir Bernard Montgomery, who, it was hoped, would have been present. The message referred to the widespread admiration aroused by the work of the Inoculation Department, and added that penicillin had revolutionized the treatment of the wounded in the field and had saved countless lives.

A collection taken at the Mansion House tables during the dinner resulted in £145,000 for the appeal fund. The centenary celebrations were continued during the week at the hospital, which was visited by the Queen, who is its president. The deeds of the land presented by the Great Western Railway for the extension of the site were handed to Her Majesty. Demonstrations of the scientific work of the hospital have also been given.

Reports of Societies

BONE AND SOFT-TISSUE DEFICIENCY IN THE LIMBS

Among the chief subjects discussed at the spring meeting of the British Orthopaedic Association, which was held at Horton Hospital, Epsom, and at Hill End Hospital, St. Albans, under the presidency of Mr. St. J. D. BUXTON, were bone and soft-tissue deficiency in the limbs, penicillin, and vascular lesions.

Cancellous Bone Grafts

Wing-Commander I. LAWSON DICK opened a paper on the use of cancellous bone transplants with a historical survey of our knowledge of osteogenesis in relation to bone grafting from the time of John Belchier in 1736. The generally accepted view now was that the viability and osteogenetic properties of transplanted bone depended upon the facility with which it could be revascularized. Osteogenesis and viability were long delayed in the depths of massive cortical grafts and most readily ensured in cancellous bone. If the mechanical stability of cortical grafts could be maintained by other means healing and consolidation would be hastened by the superior osteogenetic properties of cancellous bone. A disadvantage of removing grafts from the tibia was the not uncommon occurrence of fatigue fractures in the donor bone. The most rapid and sure method of bone transplantation was by the use of cancellous chips from the ilium.

Mr. S. L. HIGGS described 71 cases of bone grafting, 60 being for non-union of the long bones; in 20, cortical grafts alone were used, and in 40, cortical grafts plus cancellous chips. All had resulted in bony union, but union had taken at least twice as long with cortical grafts alone as it had with both types of graft, except in the femur, where the average had been half as long again for healing with cortical grafts alone. Rigid fixation must be applied in the operative procedure if cancellous chips were to do their work well and quickly. To maintain this with length and alignment was the reason for combining a cortical graft with the chips. Referring to the methods used for different long bones the speaker emphasized that there need be no hesitation in excising all sclerosed bone from the site of non-union: similarly all fibrous tissue to facilitate vascularization. Associated skin defects must be adequately treated by plastic methods beforehand.

Mr. IVOR ROBERTSON discussed the treatment of chronic infective osteitis, the essentials of which must be a careful but extensive excision of all infected bone and scar tissue and the replacement of tissue loss by bone, muscle flaps, and full-thickness skin grafts. Such treatment required careful selection, and those described had been cases of chronic haematogenous osteitis of limited area and surgically accessible and cases of chronic osteitis resulting from compound fractures or war wounds. The treatment was carried out in three stages under penicillin control: first, by excision of the bone and soft-tissue defects and then covering with Thiersch grafts; secondly, a month later, by closure after removing this graft and substituting a full-thickness skin graft; thirdly, at least two months later, by bone grafting. Where an ununited fracture was present both cortical and cancellous chip were involved. In cases of chronic haematogenous osteitis stages 2 and 3 might be combined, and iliac cancellous chips alone were packed into the dead space between the walls of the cavity and skin flap. To ensure an adequate blood supply a muscle flap was swung over them and sutured to the periosteum.

Mr. RAINSFORD MOWLEM, discussing in more detail the problem of soft-tissue defects in the limbs, emphasized the need for continuous care from the beginning of all elements of damage—skeletal, vascular, neuromuscular, and skin covering—in all injuries. No one element must be ignored, but from every point of view a limb otherwise intact was useless without its skin covering. Indeed fibrosis secondary to infection and exposure—the influence of this upon underlying muscles and joints—would prevent adequate treatment for these deeper parts and greatly increase the disorganization of the limb as a whole. The use of free grafts and pedicles or flaps was discussed. In the former, split grafts could be applied at any time during which there was a good vascular surface, and generally as soon as possible. For adhesion, maintained pressure was preferable to any glues. If the bed was avascular it must be excised. The presence of infection was no contraindication to grafting so long as it was dealt with by suitable chemotherapy. Pyocyaneus, proteus, or *B. coli* infection was a special problem, but even here successful grafting was not impossible. Exudation was the difficulty, and its mechanical effects could be minimized by using strip or postage-stamp-shaped grafts. After a month all grafts tended to become dry and to contract; massage with grease would help. Grafted areas below the knee needed prolonged pressure bandaging to reduce the ill effects of oedema. In weight-bearing surfaces keratosis might be aided by the use of the sulphydryl radicle. Usually here, however, split grafts should only be a preliminary to whole-thickness grafts. The design, formation, and methods of transplanting whole-thickness grafts were discussed, particularly the possibilities, where indicated, of flap grafts in the primary treatment of certain types of injury, noticeably in the hand.

Penicillin Treatment

Prof. L. P. GARROD said that, whereas the results of penicillin therapy in soft-tissue lesions could be almost guaranteed, the story was very different in bone lesions. In the future more liberal and purer supplies of penicillin should be available. With greater purification three types of drug were being isolated, the use of which might be found to be specialized according to the type of infection. Improved methods of parenteral administration now gave greater comfort to the patient and greater convenience to the staff. One of the difficulties was the rapid dissipation of the drug's effect, and this problem was being investigated by U.S. workers with the development of suspensions in oil and so forth, which were more slowly absorbed. It was hoped that manufacturing methods would eventually permit oral administration, the need, of course, being to protect the drug from the gastric acidity. British economy had called for much greater exploitation of local administration of penicillin, and there was much to be said for the good effects when thus used; adequate concentration could be achieved where most needed. Economy in the use of the drug had resulted in the discovery that the effect of penicillin, unlike that of other antiseptics, did not depend on its concentration. Its full action was obtained in low strengths; nothing was gained by increasing it, and, in fact, with some penicillin the reverse effect occurred. Prof. Garrod said the use of penicillin with sulphonamides was still being discussed, but his own work, though not conclusive, suggested that the sulphonamides interfered with the effect of penicillin on rapidly multiplying organisms.

Dr. G. F. KALMYKOV (U.S.S.R.), in a paper on end-bearing amputation stumps in the lower extremity, said that an important field of surgery after the war would be concerned with re-amputation, because of the practice of emergency primary amputation behind the battlefield leaving definitive amputation to a later date. The extent of this varied in different nations. In Soviet Russia the percentage of re-amputations required was not less than 80. At one large centre in the U.S.A. he had found the percentage to be 78, while in British hospitals it did not exceed 25, which was explained by the more frequent flap amputation instead of the guillotine. Soviet surgeons where possible sought to create end-bearing stumps by an osteoplastic operation. Thus they followed the work of Pirogoff, whose well-known operation in the lower leg was being performed in Russia to-day. Other methods practised were those of Bier in amputations below the knee and Gritti Stokes in amputations above the knee. After such operations it was very important to prepare the stump properly for end-bearing: the latter achieved better distribution of weight within the prosthesis and resulting improved gait and confidence.

Dr. M. N. POLONSKY (U.S.S.R.) described a new type of prosthesis in amputations through or near the hip-joint, which, he thought, solved the well-known difficulties of limb-fitting in this region. The advantages claimed were the relative lightness, greater comfort in walking and sitting, and greater economy in manufacturing costs and time. A normal type of above-knee prosthesis was employed, fixed to the usual type of pelvic band from the front of which a broad leather sling passed continuously downwards into the front of the prosthesis, over a transversely placed wooden roller, and out through the back of the limb to be attached to the back of the pelvic band, where its tension could be adjusted by lacing. The top of the appliance held a slightly hollowed, springy platform with soft felt lining upon which the soft parts of the hip gained a shock-absorbing support in walking.

Intervertebral Disk Lesions

Dr. E. J. CRISP, dealing with the early diagnosis and treatment of intervertebral disk lesions, said that the lumbar disks suffered trauma more often than was generally appreciated, but in the absence of crural pain or radiographic changes the resulting lesion was apt to be mistaken for sacro-iliac strain or fibrositis. The condition might be easily recognized by the extreme and persistent lumbar spasm at first associated with an increase in the lumbar concavity; later, scoliosis to the side of the lesion and lumbar kyphosis developed with sciatic pain, the lordosis occurring when rupture of the annular fibrosis was incomplete, and kyphosis when it was complete. Treatment was advised by conservative means along well-recognized lines such as the use of the plaster jacket. The essence of Dr. Crisp's views was that persistent lumbar spasm and a "tight" lumbar spine in an otherwise healthy patient indicated trauma to a disk and should be dealt with before the onset of sciatica.

Mr. J. E. O'CONNELL based his observations on the diagnosis of lumbar intervertebral disk protrusions on a study of 240 patients operated upon; 227 of these explorations had given positive evidence of intraspinal protrusions. By careful analysis of the clinical pictures one could locate with accuracy the site of intraspinal nerve-root stretching which affected the extradural portion of the nerve root leaving the spinal canal at the intervertebral foramen next below the disk level affected. In his series 39 cases had been studied before operation by myelography with 6 negative (15%) explorations. In 201 cases explored without myelography there had been only 7 negative operations (3.5%). While a variety of conditions could occasionally produce a picture similar to that of a lumbar disk protrusion, there were only three which did so at all frequently: an intraspinal tumour, a metastatic tumour in the lumbar vertebrae, and spondylolisthesis. Clinical examination would help in the differentiation, but certain accessory methods might be necessary. The speaker emphasized the need for adequate excision of the disk at operation. With proper selection the results in the majority of cases were excellent. Backache might prove to be frequent but rarely incapacitating. There had been a few recurrences, most often in the opposite leg.

Miscellaneous

Prof. J. PATERSON ROSS, in a paper on ischaemic phenomena following vascular injuries in the lower extremity, drew attention to the relation of the origin of the sural arteries, supplying the gastrocnemius muscles, to a region of special vulnerability in the popliteal artery. If these and all the terminal branches of that artery were blocked the leg was liable to be useless and sympathectomy would not improve it; pain might necessitate amputation. Where the sural arteries had been blocked but the collateral circulation preserved pain in the upper calf was troublesome after walking 300 yards; this was relieved by sympathectomy. If the popliteal artery had been damaged below the sural vessels pain was felt only in the lower calf and was not appreciably affected by sympathectomy. Block high up in the popliteal or femoral artery gave a good leg, which could often be improved by sympathectomy because the vessels to the calf —even if small—were still open. The popliteal artery was vulnerable to direct injury from bone and was liable to "spontaneous" thrombosis, which might be related to less direct trauma and to thrombosis the result of degenerative changes. In none of the cases described did gangrene occur, but in cases in which the popliteal or femoral vein had to be tied venous congestion was troublesome and was worse after sympathectomy. In arteriovenous fistula, if the main artery was ligated a good collateral arterial circulation developed, but without coincident ligation of the vein excessive venous drainage rendered the circulation of the periphery precarious. In one case of external iliac artery ligation in which the arteriovenous fistula had not been recognized, and also in 2 cases of wounds of the femoral artery and in 2 wounds of the popliteal artery, immediate paralysis of the lateral popliteal nerve occurred, suggesting an important additional segmental supply from the popliteal artery. These recovered like a regenerating peripheral nerve. Major D. LLOYD GRIFFITHS, R.A.M.C., remarked on the large number of cases of vascular injury to the larger vessels which he had seen in two years at a number of centres. He attributed this to the great conservation (due to chemotherapy) of limbs which formerly would have been amputated. In the past, and even now, ligature of main arteries had too light-heartedly been carried out. He considered that a very large proportion of all of them, even at reputedly safe sites, had been followed by vicious effects in the periphery, such as intermittent claudication, incorrigible anaesthesia, and gangrene of the digits. He pleaded for greater practice of lateral suture of arterial wounds and avoidance of ligature.

Fracture of the medial epicondyle displaced into the elbow-joint was discussed by Mr. JAMES PATRICK, who said that radiological diagnosis might appear difficult owing to the patient's being unable to extend the elbow in order to get a good antero-posterior view. If the medial epicondyle could be seen in the lateral view through the joint line, it could be regarded on this view alone as being incarcerated in the joint. After reduction of the incarcerated fragment (and in all simple medial epicondyle fractures) the fragment lay above the level of the joint line and so ceased to be visible in the lateral view. Reduction in early cases could be done easily by anaesthetizing the patient, gently abducting the forearm on the humerus, and applying faradism to the flexor muscles. Cases missed for more than five or six weeks after injury should be treated conservatively. In such cases the epicondyle eventually developed a bony fusion to the ulna. Anterior transposition of the ulnar nerve was probably unnecessary.

In some observations on scoliosis in relation to thoracic disease Mr. C. PRICE THOMAS said that this type of scoliosis followed most commonly upon conditions involving the pleura—e.g., chronic empyema and imperfectly treated haemothorax. Pulmonary fibrosis and atelectasis also gave rise to the deformity, but these only did so when the mediastinum was fixed. The underlying cause was a concentric pull on the chest wall towards the lung root or increase in intrathoracic negative pressure, or both. There was a striking difference in the chest deformity from that found in primary scoliosis; the intercostal spaces were much more contracted, and the curvature of the rib angles was increased and the anterior part of the chest flattened on the concave side of the scoliosis. The impression gained also was that vertebral rotation was not so marked in thoracic scoliosis. Mr. Thomas illustrated the types of remedial exercises used to prevent the deformity, in treatment of the causal disease, and in after-care of thoracic operations. In some operations, however, because so much of the spinal stability depended upon muscles having rib attachments which were lost, some degree of scoliosis was inevitable, but even so it could be mitigated by remedial exercises.

Mr. A. D. LE VAY, in a paper on costo-clavicular compression of the brachial plexus, discussed the importance of this factor in explaining certain neurological and vascular disturbances in the upper extremity, based upon one personal case and reference to recent literature. The patient a year previously had been treated for symptoms of the "scalenus syndrome" type (without cervical rib) by tenotomy of the scalenus anterior, after which the symptoms were much aggravated. Mr. Le Vay then operated under local analgesia, and found that the subclavian artery and brachial plexus were very superficial and bound to the back of the clavicle by dense inflammatory fibrous tissue. The artery was small and transversely grooved as if just released from a clamp; by bracing the shoulders back these structures were firmly squeezed between the clavicle and rib; a portion of the latter was excised so that artery and plexus sank back against the pleura. This operation was quickly followed by practically complete recovery.

Dr. P. BAUWENS demonstrated a method of measuring the action potentials of normal and denervated muscles, using a special amplifier with the cathode-ray oscilloscope connected by terminals embedded in the muscles being tested. By attaching a shunt having a resistance exactly counterbalancing the amplifier, with a microammeter it was possible to switch over during the test, and then from the calibrations of the microammeter obtain quantitative readings which were of great value in addition to the qualitative impressions received from the sounds emitted from the amplifier. Dr. Bauwens also demonstrated another apparatus devised by him which, taking advantage of the slower chronaxia of denervated muscles, enabled responses to electrical stimulation to be obtained from these muscles without affecting normal muscle fibres. Mr. W. SAYLE CREER showed a cinematograph film of foot faults related to form and function which, by means of dissections and ingeniously contrived models, illustrated the anatomy and physiology of the foot, its pathology and treat-

ment. A clinical demonstration was given at Horton E.M.S. Hospital by Mr. St. J. D. Buxton and members of the staff of that hospital; Dr. P. H. Jayes, of the Plastic Unit, East Grinstead; Dr. E. E. Harris, of the Heritage Craft Schools; Mr. B. H. Burns and Mr. R. H. Young, of Botley's Park; Mr. F. C. Durbin, St. Nicholas Hospital, Pyrford; and by Mr. G. N. Goulden, Guildford.

LOCAL HEALTH SERVICES IN THE U.S.A.

At a recent meeting of the Fever Group of the Society of Medical Officers of Health, Dr. M. MITMAN presiding, Lieut.-Col. HUGH R. LEAVELL, of U.N.R.R.A., read a paper on present trends in local health service in the United States. He said there was a movement to incorporate cities and the surrounding suburban and rural areas into a single administrative health unit. Health centres were increasing and provided all types of preventive (and in some cases also therapeutic) services. In spite of objections on the part of some medical officers of health there was a movement to combine all Government-supported health services under a single administrative head. Health education of the public was being approached on a much broader basis and more intelligently than ever before. The quality of public health service was also improved through extension of the merit system, more adequate compensation, more widespread full-time service, and a wider use of public health nurses, etc. A planning committee of the American Public Health Association, with Dr. Haven Emerson as chairman, had recommended that the local health units in the United States be set up in accordance with certain fundamental principles:

1. The entire area and population of the United States should be served by full-time local health units. (In 1942, 31% of the population had no full-time service.)

2. The local community should be responsible for providing basic public health services—namely, vital statistics, control of communicable disease, environmental sanitation, public health laboratory services, maternal and child health services, and public health education.

3. A minimum population of 50,000 should ordinarily be required to provide necessary financial support of a local health unit.

4. The district for which a local health unit is responsible should have a distance from the centre to the periphery of not over 25 to 40 miles.

5. Districts should be set up to include both rural and urban population where possible, and there should be a minimum of 3 general hospital beds per 1,000 population, and a physician–patient ratio of not less than 1 to 1,500.

6. The minimum personnel for a local health unit should be: medical officer; 1 public health nurse per 5,000 population (with at least one of supervisory grade); 2 sanitation officers per 50,000 population (with at least one of professional grade); and 1 clerk per 15,000 population.

7. The local health unit should be suitably housed so that its work might be performed effectively.

These recommendations had been implemented by nearly all the 48 States in their planning. They would be used by the United States Public Health Service in allocating Federal funds for health purposes to the various States.

Dr. MELVILLE MACKENZIE (Ministry of Health), describing a recent visit to the United States, said he was impressed by the enthusiasm of all public health workers. Co-operation between the public health and university authorities was very close. He gave instances where the statistical approach to problems had been most helpful in planning future public health programmes. Public health nurses were highly trained and not considered eligible to practise until 28 years of age; they tackled a wide range of health problems in home visiting. Laboratory facilities in the best public health departments were highly developed; in some cases it was obligatory for the practitioner to submit specimens—e.g., in a suspected typhoid case—and health officers were kept informed of possible foci of infection by receiving copies of laboratory reports. Diphtheria immunization tended now to be combined with immunization against whooping-cough, and was undertaken when the child was 3 months old. In some cases it was thought necessary to inoculate all children against tetanus. In many health centres the social amenities for parents and children avoided the atmosphere of a place to which people only came when they were ill. Health education, including that of the medical profession, was very actively pursued, and wide use was made of wireless, schools, etc., for health propaganda.

Dr. A. TOPPING (U.N.R.R.A.) felt that health propaganda was sometimes considerably distorted by the Press in America. He was surprised to find that payment was sometimes required for essential treatment such as plasma transfusion. He agreed that American public health nurses had a long and exhaustive training, but thought that the best type of health visitor in this country was second to none. The ratio of 3 hospital beds per 1,000 population was only half the number aimed at in this country. (Col. Leavell later explained that the figures he had given were minimal.)

Dr. F. J. BENTLEY (L.C.C.) derived comfort from the fact that the United States had found it difficult to avoid some of the complexities of public health administration which worried us in this country. He was assured by Col. Leavell that the shortage of nurses was equally acute in America, where the public health service was subsidizing the training of 60,000 nurses. In reply to other questions Col. Leavell said that any State could refuse to adopt the recommendations for reorganizing its health services, although some financial pressure could be exerted. Medical care (including hospital provision) was unfortunately not always the responsibility of the public health department. In matters of housing the department was in an advisory position only. The largest local health units would be in the big towns and might include populations up to 250,000, but units of this size would be exceptional.

EVOLUTION OF SPEECH ORGANS

At the recent annual meeting of the Manchester Medical Society Mr. V. E. NEGUS gave an address on the evolution of the speech organs of man.

He said that sound had been adopted by man as a means of communication because of its many advantages; alternatives were gesture, olfaction with its very limited application, and touch. Sound could be used in the dark; it would pass obstacles which impeded vision and travel against the wind; it could be used to express ideas; and it left the hands free. The human being's vocal apparatus consisted of the sound-producing larynx, with a series of resonators—the lungs, the pharynx, nose, and mouth—to amplify and modulate the mixture of pitches resulting from vibration of the vocal cords. The larynx was evolved as a valve to protect the lungs and not as a vocal organ; it had undergone many modifications. The simple muscular sphincter of lung fish had changed in higher animals to a more complicated organ with cartilages which provided a framework and thus facilitated opening and closing. Herbivorous animals had a special modification to help in swallowing large quantities of semi-solid food; the margins of the larynx were raised to prevent fluid entering the air tract. Animals of herbivorous ancestry which took to climbing trees had a secondary valve, usually called the vocal cords, the object of which was to assist in fixing the thorax when the fore-limbs were in use. In keen-scented animals the larynx was apposed to the nasal passages in order to direct the air stream through the olfactory area and thus to maintain a keen sense of smell. Man did not rely on powers of scent; in him the larynx had descended in the neck as a result of recession of the jaws and the adoption of the erect posture, and a gap was thus produced between the larynx and the palate. The pharynx thereby increased in size. The pharyngeal, buccal, and nasal resonators were capable of great variation in size and shape.

In reply to Prof. Wood Jones, Mr. Negus said that the air passages and larynx in the whale, which had no sense of smell, were closely connected to enable the air to be warmed and for inspiration to take place without the necessity for emptying the mouth and pharynx of food and water. Dr. T. H. Blench referred to the beating of the chest by gorillas and the axillary air sacs in the orang as accessories in the production of sound without using the chest muscles. Mr. Negus concluded that animals living in dense or wooded country required voice and methods of sound production, while those living in open country, such as the giraffe and vulture, did not need them.

The report for 1944 of the Institute of Physics shows that its membership increased by some 15%. Despite wartime difficulties the Groups and the Branches both at home and over-seas held meetings and conferences covering a wide range of technical and professional subjects. A new and successful venture was the publication of a series of lectures given before the Industrial Radiology Group as a *Handbook of Industrial Radiology*. The *Report on the Teaching of Mathematics to Physicists* prepared jointly with the Mathematical Association was published during the year.

Correspondence

Poliomyelitis in Malta

SIR,—With reference to your leader in the *Journal* of June 2 on poliomyelitis in Malta please compare my conclusions relative to the same outbreak at pages vii and viii of the annual report of the Medical and Health Department, Malta, for 1942; the statistics were revised in the report for 1943. My opinion was that spread was by contact droplet infection, and other means excluded. This is now confirmed by Seddon. I left open origin of outbreak, but inclined to importation of fresh strain of virus from abroad. Information now given by Seddon, not available to me then—that 200 airmen arrived in Malta in October, 1942—favours my opinion that virulent infection was freshly imported, especially when place of origin and nationality of airmen are considered. I laid emphasis on the importance of healthy carriers in introducing and disseminating infection, and said that the appearance of paralytic cases was not an absolute index of date of introduction or commencement of infection. The relative immunity of adult Maltese may be due to a racial factor; this disease is always infantile in Malta.—I am, etc.,

A. V. BERNARD, M.D.,
Late Chief Government Medical Officer;
President, Malta Branch, B.M.A.

Malta (by cable).

Portable Surgical Hospitals for China

SIR,—You will recall that in 1942 the War Organization of the British Red Cross and Order of St. John sent out to China a hospital unit consisting of doctors and nurses, who, under enormous difficulties, have rendered some aid to the wounded soldiers and the sick and wounded refugees in the provinces of Hunan, Kweichow, and Yunnan.

Now that victory has been attained in the West it is fitting that we should pay further and closer attention to the needs of China, our ally in the Far East. Accordingly the War Organization plans to send out the personnel and equipment for four portable surgical hospitals to work with the advance troops of the Chinese Army now being reorganized with the assistance of United States Army personnel. These portable surgical hospitals will consist of mobile teams with their own transport and equipment. They will probably have to operate from tents and live under canvas. Part of the staff will be highly trained Chinese. To complete the staff of these portable surgical hospitals the War Organization requires the services as soon as possible of 12 doctors (men with surgical experience) and six mechanics (if possible with first-aid training). Applicants, who must be young men, medically fit, should apply in writing, giving age and qualifications, to Dr. H. Gordon Thompson, China Section, War Organization of the British Red Cross and Order of St. John, 14, Grosvenor Crescent, London, S.W.1.

I trust that the response to this appeal for help may be as swift and effective as the need is both desperate and great.—I am, etc.,

War Organization, B.R.C. and Order of St. John, London, S.W.1.

PHILIP CHETWODE,
Field-Marshal, Chairman.

Teaching of Physiology

SIR,—Dr. Ff. Roberts's article on realism and humanism in medical training (June 16, p. 848) will, I am sure, have been read with interest by teachers of the pre-clinical subjects, for it is always of value to have the comments of those whose criticisms are not inhibited by recent practical experience of their subject. Teachers of physiology are only too well aware of the shortcomings of the present courses, and I noted with disappointment—though not with surprise—an absence of any constructive proposals.

Dr. Roberts regards as excessive the disproportion in present-day teaching of physiology to medical students between factual knowledge and practical experimental experience. I entirely agree with him, but few will take seriously his assertion that the cause is indifference or incompetence on the part of the teachers. There are, as a matter of fact, several considerations which make it difficult, if not impossible, in the present state of things, to increase materially the relevant experimental practice of pre-clinical students in physiology, desirable as this would be. These difficulties are so well known to teachers of physiology that I am inclined to think we too readily assume that they are also appreciated by those who are now improving the education of the medical student.

1. *Size of Classes and Practical Work.*—The steady increase in the size of classes together with reduction in the time available for practical physiology (owing to the introduction and expansion of other subjects) has had a considerable influence on the nature and scope of practical classes. Experiments and demonstrations which are suitable for a dozen or so students who can spend several hours over them are out of the question with a hundred or more students who cannot devote more than two or three hours on any one occasion.

2. *Use of Animals by Medical Students.*—Despite the large size of modern classes and the limited time available, it would nevertheless be a simple matter for the student to perform for himself many of the important mammalian experiments which he reads about in the books but sees only as demonstrations, if at all, but for the following facts.

Students are forbidden by law to experiment on any vertebrate animal except one which has been decerebrated by a demonstrator; the use of anaesthetized animals—even rats—is not allowed. Now it takes a certain amount of skill with the aid of an assistant and some ten or fifteen minutes to decerebrate a cat (or rat); obviously, therefore, the necessity for preliminary decerebration severely limits the extent to which mammalian experiments can be included in practical classes for medical students. If the use of anaesthetized animals were permitted, it would at once be possible to effect a great improvement in the scope and teaching value of practical physiology classes; the use of frogs could be restricted to those few experiments for which they are actually the most suitable, and a large number of valuable experiments carried out by the students themselves on mammals. Relaxation of the law in this respect would render superfluous many animal demonstrations; but there would still remain a large number for which the use of an unanaesthetized animal, previously prepared by feeding, aseptic surgery, or training, is essential—e.g., many demonstrations on the functions of the nervous system, digestion, absorption, the semicircular canals, and the reproductive organs (to quote only Dr. Roberts's examples of subjects at present learned indirectly from the book).

Such demonstrations cannot be shown to students in this country because no experiment may be performed on an animal for demonstration purposes unless it is anaesthetized throughout and is killed before it recovers consciousness (Certificate C). Moreover, since such experiments may not be demonstrated, it follows that no films can be made of them; the teaching films of animal experiments shown in this country have either been made abroad or involve only completely anaesthetized animals. A little thought will show the vast number of valuable demonstrations and films which it is impossible to make or show for teaching purposes.

3. Supply of Cats and Dogs for Teaching and Research.—Even supposing the present restrictions upon the use of animals for medical teaching and research were removed or modified, there would still remain a further difficulty which bids fair to become the most serious of all—namely, the supply of cats and dogs for these purposes. I doubt whether any teaching school in the country is able at the present time to count upon a regular supply of six cats and dogs per week. Our dwindling supplies of these vital necessities for research and teaching are obtained from private animal dealers; we are entirely at their mercy in the matter of prices, which are steadily rising (cats now cost 6s. to 7s. each and dogs from 12s. 6d. to £2). In this city alone last year *more than 30,000* stray cats were destroyed in the lethal chamber by the R.S.P.C.A.; and the use of stray dogs for experimental purposes is forbidden by law.

My own appreciation of the extent to which the teaching of physiology in this country is obstructed by the obsolete restrictions to which I refer is increased by my recollections of the methods of teaching practical physiology to medical students that I was privileged to observe in 1939 in the medical school of Northwestern University, Chicago, Ill., U.S.A., under the direction of Prof. A. C. Ivy. An ample supply of stray dogs was made available by the city authorities for medical teaching and research; and the well-balanced and extensive course of

practical instruction provided for pre-clinical students included the performance, on anaesthetized dogs, by students working in groups of four (operator, assistant, anaesthetist, and clerk) of a considerable number of experiments on the circulation, respiration, digestion, absorbtion, excretion, lymph-flow, etc. In addition each group performed at some time towards the end of their course an aseptic operation on an anaesthetized dog (splenectomy) and were responsible for the after-care of the animal. The class also witnessed demonstrations on unanaesthetized dogs provided with gastric pouches and similar preparations which were being used in the department for research.

These students went on to their clinical work not only with an extensive practical experience of mammalian physiology and the techniques employed, many of which are, of course, common to medicine and surgery, but they carried with them also an abiding appreciation of the experimental method as an approach to clinical problems; and a surprising proportion of them returned during and after their hospital training, on their own initiative, to do research—often of very high standard—upon problems directly related to their clinical work.

We all want to see the standard of physiology teaching to medical students raised higher in this country than anywhere else in the world, but we might as well admit that we are at present a long way from this ideal, and shall remain so while we are prevented from giving to medical students that practical experimental experience in physiology which they ought to have, and which, indeed, they may now receive abroad, if they are to assimilate the enormous mass of facts with which they must deal.—I am, etc.,

Department of Physiology, University of Liverpool. R. A. GREGORY.

Trench Fever as a Cause of Pyrexia in P.O.W.s

SIR,—The following case of trench fever in a batch of some 300 or more repatriated P.O.W.s is of interest, and might help to explain some cases of pyrexia that might be occurring among the many thousands of P.O.W.s now on leave in this country.

The patient, a South African, aged 33, was admitted on April 18. He gave a history of 3½ years' imprisonment, during which time he was in good health except for two relapses of malaria. He was sent on the march and developed diarrhoea. On admission he was moderately undernourished, skin dry and scaly. There were several louse bites on his arms, abdomen, and legs. He was afebrile, but three days after admission he complained of a frontal headache and had a temperature of 100° F. His heart and chest were normal, and his abdomen was distended. Liver and spleen were not palpable, there was no glandular enlargement, and his urine was normal. No abnormal organisms detected in faeces; the haemoglobin was 73%, with a total of 4,100,000 R.B.C. and C.I. of 0.9, total leucocytes 6,000.

His temperature subsided within 24 hours and he was allowed up. Ten days after this he had a second attack of fever, and this time complained of aching pains in the shafts of both tibiae and profuse sweating. There were still no abnormal physical signs except for some conjunctival injection. A blood count taken at this time showed haemoglobin 87%, leucocytes 12,000, neutrophils 60%, lymphocytes 4%, and monocytes 6%, E.S.R. 18 (Wintrobe). No parasites were seen in a blood smear taken at the height of his fever.

Subsequently he appeared well, and five days later had recurrence of fever with sweating and deep aching pains in both shins. His agglutination reactions to *Br. abortus, B. proteus*—OX 19, OX 20, OX K, were negative. A blood culture was sterile. Since then he has had four bouts of pyrexia, average 100°, occurring every 5 days with shin-bone pains. During the interim periods he feels very well.

The clinical picture of 5-day fever with shin-bone pains, the negative blood findings, and the history of louse infestation before admission make it clear that this is a case of trench fever. Treatment has been symptomatic, salicylate sufficing to relieve pain. Each bout is less severe, and the last expected bout of fever has not occurred. Sedimentation rate is still raised.

I am indebted to Dr. Robinson of the pathological laboratory for his assistance and to Major-Gen. H. H. Blake for his permission to submit this.—I am, etc.,

Stoke Mandeville Hospital, Aylesbury. J. E. DAVIES.

Treatment of Unconfirmed Amoebiasis

SIR,—It has been repeatedly stressed in recent publications that the use of emetine alone in the treatment of amoebiasis is to be condemned. The following type of case presents a problem which, according to hospital physicians in Ceylon, is not uncommon.

An engineer aged 26 complained of sore throat, headache, and pain in the right hypochondrium on respiration, one day after the ship reached a Ceylon port. He had no previous or present history of diarrhoea or similar pain, though sore throats and headaches were frequent. On examination an audible and palpable rub was noted in the right hypochondrium, basal rhonchi, large red tonsils, T. 103°. No other abnormal findings. His temperature fell to normal in three days, but the pain and rub persisted for three weeks in spite of rest in hospital ashore. Chest *x*-ray, differential white cell count, urine, and stools examined for cysts were normal. Apart from his pain he felt and looked fit. On return to the ship he was given a ten-days course of emetine hydrochloride, and local signs and pain disappeared after the fourth injection.

Hurst describes a supposed amoebic hepatitis in which the only symptom may be malaise and the only signs tenderness over the liver and an abnormal laevulose tolerance test. Sigmoidoscopy and stool examination and white cell count show no abnormality. He recommends repeated short courses of emetine hydrochloride for these cases.

Is a full course of emetine, emetine bismuth iodide, stovarsol, and chinoform justifiable in cases of subacute hepatitis which respond rapidly to emetine hydrochloride but have no amoebae in their stools, or evidence of ulceration on sigmoidoscopy?—I am, etc.,

RICHARD MEYER, M.B.,
Late Ship Surgeon,
Elderman Bucknall S.S. Co., Ltd.

London, W.1.

Malaria and Salvarsan

SIR,—With the return of thousands of malaria-infected soldiers from the Tropics a timely warning against the dangers of malaria in general and of the administration of organic arsenicals in particular—either for treatment of syphilis in malaria patients or for other purposes—seems only too appropriate. The danger is especially great, as many people may suffer now and later on from malaria without knowing it; they might even have been infected in this country, where, as we all know, anopheles mosquitoes do exist. A friend of mine has already detected a case of malaria in an officer nine months after his return from Africa who never had an attack whilst abroad.

Administration of salvarsan preparations can give rise to a cerebral malaria which, if unsuspected, only too often tends to take a rapidly fatal course. In a publication, "Häufung von Malariatodesfällen nach Salvarsaninjektionen" ("Increase in Cases of Death from Malaria following Salvarsan Injections") (*Klin. Wschr.*, Vol. I, No. 28), 23 years ago, I stressed the importance of the necessity always to think of a possible malaria in febrile conditions of unknown origin, particularly in syphilitics and those patients whom one intends to treat with organic arsenicals for other reasons.—I am, etc.,

London, W.1. ERNST SKLARZ.

Methods of Venepuncture

SIR,—It goes without saying that any reasonable person will agree with Dr. Mendelssohn and Prof. Witts (June, 16, p. 852) that everything used for venepuncture should be sterile wherever possible. I think, however, that they underestimate the difficulties of the under-staffed laboratory where the pathologist must do everything himself and at the same time handle large numbers of patients and specimens. The counsel of perfection is not easily attained under such circumstances, and I think that the method I have described has given too good results to be ignored. I may mention that the figures I gave (of over 40,000 such punctures) were not a mere guess but were founded on those taken from my card indices for annual return purposes.

As to the risk when the vein is missed, it should not be necessary to pull on the piston, as the blood appears spontaneously in the syringe when the vein is tapped. With regard to the possibility of bruising or haematomata resulting from the method, while it is impossible to ignore the impressive

array of authorities that they quote, it may, I think, be sufficient to say that with this method such sequelae just do not occur; indeed, it is hard to see how they can. So far as "following up" is concerned to ascertain the incidence, if any, of infection or haematoma, it may be mentioned that these cases afford an almost unique opportunity to do so, as they are cases of chronic rheumatism attending a large clinic, nearly all of them attending for many months, and some attending for a number of years, most of them being seen at frequent intervals. I am still seeing some who first attended in 1933. I may say that at no time has there been any evidence of jaundice or other infection.

I am, of course, only too acutely aware that it would be fatally easy to murmur *Experientia docet* and leave it at that. It might easily be alleged that no case of infective jaundice has yet come along to infect the instruments, though with such a large number of cases the possibilities would seem to be considerable. I am as anxious as Prof. Witts to avoid any mischance, and can assure him that he is mistaken in thinking that I treat this important part of my profession too lightly; I am quite prepared to use any better methods that may offer themselves. I do indeed remember the passively filled tubes used at Guy's years ago, but I also remember how extremely bad they were, how impossible to use on very small veins, and also what a row I got into with the contemporary professor for venturing to criticize them. In order to obtain enough blood before clotting occurred, cruelly large needles had to be used, even when a mouth-suction tube was employed. I well remember how the patients, quite rightly, objected to them, and I have known them refuse to have any further punctures made with them after one experience. I soon gave them up, and used apparatus of my own. A venule is not bad, but it is hard to collect measured amounts with one, and it is never possible to be sure that the vacuum is really there when needed, though I have often re-evacuated them, using the makers' own method.

One thing, however, does emerge from this discussion—that venepuncture should not be entrusted to inexperienced persons. As house officers we always used to do them ourselves when they were not done by our superiors, and it is hard to see why the house officers of the present day should delegate the task to subordinates; with all due respect to those able women, it should be no part of a sister's duty. If such delegation is avoided the risks of disaster such as that recently described should be eliminated.—I am, etc.,

Haywards Heath. J. W. SHACKLE.

Mono-articular Osteo-arthritis of the Hip

SIR,—In an interesting article on treatment of this condition Mr. Grant Waugh (June 23, p. 873) has stressed the value of acid injection of the joint. His technique, however, consists of two parts: (1) the injection and (2) very gradual manipulation, and *flexion-abduction-extension exercises, without weight-bearing, consistently and perseveringly carried out by the patient* (my italics). In my view it is these exercises that are the crux of successful treatment for this condition. They are simple and consist of: (*a*) flexion of thigh and flexion of knee on chest assisted by the patient's hands; (*b*) straight leg raising to the perpendicular and then allowing the leg to fall at right angles to the trunk; and (*c*) abduction of both legs with the feet inverted. The patient should be taught how to do the exercises rhythmically, without jerk and with proper intervals of relaxation. Further, each exercise should be done up to a dozen times each morning with the patient lying on a bed or the floor. Then, if carried out consistently and perseveringly, there should be no need for injection of the joint or manipulation.—I am, etc.,

Bath. G. R. P. ALDRED-BROWN.

Puerperal and Lactational Mastitis

SIR,—With reference to the letter (June 23, p. 886) from Dr. V. Mary Crosse giving the incidence of mastitis in Birmingham during the past seven years I should like to take the opportunity of correcting a misapprehension on the part of Dr. Crosse. The figures published by me do not refer to the city of Dundee but to a much smaller town of some 43,000 inhabitants.—I am, etc.,

Public Health Department, Dundee. A. A. FULTON, Maternity and Infant Welfare Medical Officer.

"Predisposition" to War Neuroses

SIR,—I concur with the views expressed by Dr. F. Dillon (April 21, p. 570). A full investigation into the records of the Service man who has seen action beyond what might be termed a given saturation period in this war is indicated. This is naturally only feasible if the Service medical branches either conduct it or open their otherwise secret records to outside investigators. A "combined operation" would be conducive to a balanced view, seeing that the rehabilitation period on discharge from the Forces would needs have to be included.

The personal as well as the family history of the patient would, in my submission, aid both the personnel selection departments of the three Services when the conscript enlists and for posting purposes on completion of initial training, and the Service medical branches who watch over the progress of the enlisted as a fighting man.

Dr. William Brown in his *Peace and War* (*Essays in Psychological Analysis*) has shown convincingly that war itself is a state of national neurosis. Neurotics of certain types appear and have proved themselves to be capable of excellent and brave conduct under fire, whereas the day-to-day existence of the average civilian would produce recurrent lapses into some form of delinquency or abnormality.

In my experience, however, the junior leader must have a stable personality. Leadership in the face of the enemy after all requires coolness as well as audacity, appraisal as well as love of danger, a feeling of high obligation both for the sake of personal prestige and in view of the position in the formation and the responsibilities that go with it. This equilibrium would appear to be lacking in a psychopathic personality.—I am, etc.,

Hempstead, Long Island, N.Y., U.S.A. K. H. STEIN.

Psychosomatic Factors in Disease

SIR,—Your correspondent Dr. Victor Leitner, in his letter on psychosomatic factors in disease (Feb. 17, p. 235), states that "it is just as dangerous to label as neurotic a patient with a *real* complaint as vice versa." What a deplorable observation! Does Dr. Leitner really suggest that the neuroses are not real complaints? His injunction to remember that "some chronic conditions of slow and insidious onset—e.g., pulmonary tuberculosis and pernicious anaemia"—may simulate neurotic illness long before any definite clinical signs can be elicited is important enough to warrant more than "a careful taking of the family history in cases of this sort." It cannot be too strongly emphasized that any fault in function, efficiency, or stability should be interpreted as a fault of the entire body mechanism and not as some purely local upset quite divorced from the rest of the body.

In endeavouring to identify whether an illness is predominantly physical or psychogenic a careful history is imperative. Search should be made for predisposing and precipitating factors. The duration, intensity, and appropriateness of the symptoms should be carefully elicited and considered, and a possible motive for the disability suspected when the symptomatology generally or the emphasis laid on a particular symptom is unusual, exaggerated, or incongruous.

For administrative purposes it is obviously important to reach a diagnosis. I cannot agree that the "labelling of a patient as neurotic" is in any way "dangerous." Such a classification should in no way preclude the early identification of organic criteria if these present themselves, provided that the physician in charge of the case is "psychosomatic conscious."—I am, etc.,

S.E.A.C. E. STUNGO, Major, R.A.M.C.

Venereal Disease Prophylaxis

SIR,—For years I have scanned medical literature in the hope of finding the announcement of a prophylaxis whereby "the man in the street" should, on occasion, protect himself from infection with the germs of venereal disease. In the meantime I have often seen in non-medical literature statements to the effect that in various parts of the British Empire the Government has had to spend larger sums on the treatment of venereal diseases than (say) on "poor relief."

In the last war, as a battalion medical officer, I had no great difficulty in carrying out the commanding officer's request that the unit be kept free from the incidence of venereal diseases when we were in certain areas. In this war during the past four and a half years I have not seen a single case of syphilis, gonorrhoea, or chancroids arising among the various Service units of whom I have been in medical charge. I ascribe this to the fact that men have fully co-operated in the work, after hearing that the prophylaxis advised would be absolutely effective and that its employment after every exposure would be as sure a sign of their culture as the daily use of their toothbrushes, and that venereal diseases can only infect the ignorant, the careless, and the helpless. In some areas showers of well-meaning but inaccurate and rather hysterical pamphlets have proved, as I understand from medical and police authorities, a godsend to the gonococcus and the spirochaete, which will continue to sweep forward like the four horsemen of the Apocalypse until the medical profession mobilizes the forces of prophylaxis against them.—I am, etc.,

A. C. KIRTON.

The Cloistered Nurse

SIR,—There is much discussion to-day about the difficulty of finding candidates for the nursing profession. Even now there are hospital authorities who ignore many aspects of the problem.

Some years ago, when in municipal employ, I was acutely conscious of certain handicaps and discomforts of hospital life. I had a bed-sitting-room into which the sun never shone; here the day and night were disturbed by screams from the children's ward, groans from the old men, a gramophone above, and a piano below. Such "noises off" made life somewhat trying and were also audible from the nurses' quarters. On more than one occasion I was going round a ward with a junior nurse, in the absence of the ward sister or staff nurse, and had an opportunity to learn quite a lot. Several times I found these girls acutely unhappy, and several times I had to rush them into a side ward where they had a good cry. Between sobs I used to hear, "Oh, I've been in London five years and I haven't been in anybody's house once." As a Londoner who has been lonely in London I think I know what this means. If there is a normal then it is in the house and home and not in an institution. Both nurses and doctors have not only to work, but also to live, with people with whom they may have no affinity at all. One is tolerable for a few years in one's youth. The two together may become unbearable. Yet it is quite common to meet members of hospital staffs who are resident and who likewise confess in candid moments that they feel strange in a private house.

Now this is on the border line of sanity, and we should see to it that those who deal with the sick never get into this state. It is not so much a question of money as of imagination and humanity. After much effort I did manage to start a social club for the nurses. The opposition and the apprehensions which this step excited were quite amazing. Even now senior nurses are exposed to dragooning and coercion quite out of keeping with their status and their age. Municipal authorities are, I think, worse offenders than those of voluntary hospitals. It has not occurred to some that at the bedside something should go out of the medical and nursing attendants into the sick patient. And this intangible something, some little courage and cheerfulness, cannot be imparted if the staff, by the conditions of their living and employment, feel unhappy and humiliated. Everyone who has the care of sickness must feel a "person" to be able to do any good. It is to be hoped that in post-war medical schemes this point will not be overlooked.—I am, etc.,

G. C. PETHER,
Major, R.A.M.C.

B.L.A.

Examinations for Nurses

SIR,—One point in Mr. Wilfrid Adams's excellent letter (June 16, p. 857) drawing attention to the increasing burden of bookwork laid upon the student nurse seems to call for comment. He says that her studies are on a par with those of a medical student. This is not quite true in so far as the medical student does at least dissect the body, look down a microscope, use a stethoscope. He is not required, as the nurse is, to memorize like a parrot textbook descriptions of such things as the microscopic structure of tissues, the appearance of the commoner micro-organisms, the signs of pneumonia.

Those of us who are accustomed to teach student nurses must often have reflected upon the waste of time and effort involved in imparting and acquiring all this second-hand information which can have no greater practical or educational value to a nurse than a knowledge, say, of the anatomy of the fly's eye or the markings on Mars.—I am, etc.,

Hove. CONSTANCE OTTLEY.

SIR,—As a State-registered nurse I have been reading with great interest the correspondence on the standard of the nurses' examination papers, and hasten to write in defence of the General Nursing Council and against lowering the standard.

In his letter of June 16 (p. 857) Mr. Wilfrid Adams states that by studying for such examinations a nurse becomes less proficient. Is this possible? A nurse practises her nursing procedure for 54 hours weekly and does all her studying and attends the majority of her lectures in her off-duty time. Whereby does the patient suffer? Or doesn't Mr. Adams think 54 hours weekly is long enough to practise nursing procedure?

The knowledge of the course of disease, the treatment of it, and what complications to watch for surely impresses a nurse with the importance of her nursing care much more than orders issued by a "good sister" to do this or not to let the patient do that. Knowledge of the results which her efficient nursing is likely to produce surely urges her to put that little extra effort into her work that would be lacking with ignorance. Certainly encourage the art of nursing as much as possible, but what use would the art be in an emergency unless combined with knowledge? I would therefore say: teach her the technical side, and any nurse of average intelligence who is interested in her work will apply that teaching to the betterment of her nursing procedure.

There is no arguing the fact that there is a shortage of nurses, but improving the accommodation and recreational facilities is more likely to encourage a girl to the profession than cutting out some of the interest from the work; and increasing the domestic staff of hospitals would give the nurses more opportunity to practise the art of nursing. Even as theatre staff nurse of a big general hospital I spent many hours a week scrubbing floors when I could have been more profitably employed in teaching junior nurses.—I am, etc.,

Redruth. JEAN L. PEARSON.

The Position of Medical Research

SIR,—I have searched the various political effusions dealing with proposals for a new era in health together with the more cautious proposals of medical bodies, and am surprised to find little or no attention being paid to that fountain-head of medical progress—namely, medical research.

At the present moment the greatest advances in medicine—such as sulphonamide therapy and penicillin therapy—come to us from the field of biochemistry. The opportunities available for those of us with the necessary academic qualifications to justify us working in this field are extremely small and poorly paid. Few can afford to exist upon the quite inadequate salaries—£400 a year is about the average—at present offered. Some of our best brains are earning good money in consulting medicine or surgery, and it is quite uneconomic to expect these men to sacrifice part or the whole of their incomes for the good of mankind.

Were it not for the security and fair pay offered by commercial concerns I doubt if we should have progressed as far as we have done. In industry one of the highest-paid employees is the research chemist. Why cannot research workers in medicine have similar security free from financial stress? In art it would seem necessary to be down at heel, penniless, and half starved before one can produce a masterpiece, but surely this should not apply to medicine. Perhaps the large insurance firms would find that a dividend could be paid from financing research in preventive medicine; it would certainly cut down the number and extent of the claims made against them for sickness and probably premature death.—I am, etc.,

Bebington, Cheshire. JOHN HERBERT HANNAN.

Housing the Returned Consultant

SIR,—Col. T. W. Preston (June 23, p. 888) has touched the root of the problem. The "Harley Street tradition" dates from the days at the close of the last century when the majority of London consultants lived in this and neighbouring streets. Now that few actually live there, and those who practise are outnumbered by the "consultoids," the tradition has no foundation and must sooner or later collapse. The future of consulting practice lies with the hospitals—that is, consultants must see private as well as hospital patients at their hospitals and admit such as need institutional treatment into private or contributory wards. Only so can group investigations be arranged without loss of time or needless expense. Only so can the public be protected from exploitation and assured that they are getting specialist service in exchange for specialist fees. If hospitals will put facilities for interviewing and examining private patients, with reasonable attendance and secretarial help, at the disposal of members of their staffs, the majority of consultants returning from the Forces and the E.M.S. will gladly turn their backs on the *juju* of the brass plate.—I am, etc.,

London, N.W.8. W. H. OGILVIE.

SIR,—Major H. B. Stallard's recent letter has raised a wider issue. He very rightly stresses the difficulties confronting the returning Service doctor. These difficulties are in great part due to the inundation of the fields of British medical practice by alien doctors, who, in the first instance, sought sanctuary in this country. Our profession not only offered them hospitality but the means of livelihood in their need by admission to our *Medical Register*. The very political conditions which drove these men from their homelands have been reversed by the Allied Armies, and with these Armies went our own doctors: and here is the crux of the matter—many of our doctors are still there. For many of these this has meant the sacrifice of nearly six of their peak earning years. How is it possible to justify the retention of one British doctor in liberated Europe while there remains one refugee doctor in this country? Surely his claim to practise his own profession among his own folk is the privilege of any doctor. He should be afforded every facility to do so.

We have no doubt that this facility would be very acceptable to every British doctor whether still over-seas or, having served in the Forces, is now attempting to resume his pre-war vocation.—We are, etc.,

L. T. CLARKE, Major, R.A.M.C.
R. S. MACHARDY, Major, R.A.M.C.

Obituary

Dr. GEOFFREY HEMPSON died on June 2 after a long illness. He was educated at Sherborne and University College Hospital, taking the Conjoint qualification in 1915. He immediately joined the Army and served with distinction, reaching the rank of captain. On his return home he took the D.P.H., and after house appointments at U.C.H. and the Brompton Hospital, decided to specialize in tuberculosis, gaining the post of senior assistant medical officer at Pinewood Sanatorium. It was during his years there that he laid the foundation of that skill and knowledge which led to his appointment in 1927 as medical superintendent of the Royal National Hospital for Consumption, Ventnor, which he was to serve unremittingly until ill-health compelled his retirement in 1942. Geoffrey Hempson (writes A. K. M.) was above all a physician, skilled at his specialty and able to command the confidence of his patients through long spells of treatment. His great charm of manner and his innate kindness gained him the affection as well as the respect of his patients, and indeed of all the hospital staff. Nobody who worked under him will forget his kindness and courtesy. During his tenure of office considerable developments in the treatment of tuberculosis occurred, for this was the era of the wide development of artificial pneumothorax and thoracoplasty: Hempson kept the hospital fully abreast of these modern methods, and it was during this time that major thoracic surgery was first undertaken there by Tudor Edwards. He proved a skilful administrator, able to get discordant personalities to work together, and the building programme carried out at this time owed much to his wise advice. His love of animals and his knowledge of them were remarkable, and he was always to be seen early in the morning exercising his dogs, which he bred and showed with success. Hempson excelled at amateur theatricals and was never happier than when coaching the hospital staff for the annual Christmas show. His enthusiasm, his striking personality, and his histrionic ability made it difficult to live up to him on the stage, and he was the mainspring of a long succession of successful shows. The reorganization of the hospital to take casualties under the Emergency Medical Scheme threw a burden on Hempson, for his conscientiousness made him attend personally to the smallest details, and finally his health broke down and retirement became necessary. He leaves a wife and daughter.

Dr. JOHN H. MOIR, who died on June 7, was born at Newhall, in Derbyshire, son of J. H. Moir, M.D. Both his parents came from Aberdeenshire. He entered Aberdeen University as a medical student in 1901 and graduated M.B., Ch.B. in 1907, proceeding M.D. four years later; he also took the D.P.H. "Derbyshire" writes: To all his many friends the death, at 59 years of age, of John Hay Moir must come as a shock. After qualification he became house-surgeon at the Children's Hospital, Birmingham, and later was R.S.O. at Southwark Infirmary, and finally joined his father's practice in South Derbyshire. After the death of his father he remained in single practice until the outbreak of the last war, when he at once volunteered for service. While a lieutenant, R.A.M.C., he was decorated with the D.S.O. for an act of outstanding courage. Later, as a captain, he received the further awards of the Military Cross and bar, and was also twice mentioned in dispatches. His old friends in the 17th Royal Fusiliers and the 20th General Hospital will not forget his work and deeds on active service in France and the Mediterranean. In 1919 he returned to his practice and, when joined in partnership by Dr. E. M. R. Frazer in 1926, removed to the neighbouring district of Swadlincote, where he lived until his death. He was honorary surgeon to the General Infirmary, Burton-on-Trent, and examining surgeon to the Midland Colliery Owners Mutual Indemnity Company. In the latter appointment he displayed a unique knowledge of the application of the Workmen's Compensation Act to medical problems. His death after an illness of a few weeks leaves a sense of great personal loss to his medical colleagues and patients alike. His sterling character and shrewd clinical judgment were hidden under a quiet and slightly deprecatory manner. Though admitting no medical politics, he had the happy knack of contributing original suggestions at medical and lay meetings which carried real weight. Beneath it all lay a fine sense of humour, and many of his witty, and often disconcerting, remarks will be remembered and treasured. Jack Moir was a sportsman who loved life, his friends, his work, and his patients; and his many quiet kindly actions won him the gratitude and respect of all who knew him. Struck down by his fatal illness with appalling suddenness, and knowing he had not long to live, he remained to the end a very gallant man.

The death of Dr. VISHWA MITRA LAMBAH on May 12 has removed one of the most beloved and attractive figures from Bilston, where he practised medicine for many years. Born at Peshawar City, North-West Frontier Province, on April 2, 1887, he studied medicine first in Bombay and then at Edinburgh University, where he obtained the degrees of M.B., Ch.B. in 1912, and B.Sc. in Public Health. In 1914–15 he served in the Indian Medical Service and in 1916 became resident medical officer at New Cross Hospital. From 1916 until his death he worked as a general practitioner in Bilston, where he also held many appointments: acting M.O.H., police surgeon, examiner and lecturer for the St. John Ambulance Brigade, and A.R.P. medical officer to all the works in Bilston. Apart from this, Dr. Lambah took a vivid interest in social activities there and was president of the Bilston Horticultural Society for 7 years and president of the tennis club for 20 years, during which time he did much to improve them. He worked untiringly to promote friendship between the British and Indian peoples and was well equipped to do this, being closely associated with both. He was president of the Birmingham Indian Association, president of the Punjabee Society for 8 years, vice-president of the Indian Medical Association, vice-president of the Chief Punjab Association, and Trustee of the Indian Social Conference. He organized many receptions in London, Birmingham, and Wolverhampton to give us the opportunity of meeting representatives of India. Some notable instances were the receptions given to delegates of the three Round Table Conferences and the Indian cricket team. Dr. Lambah was a philosopher, patient and unassuming, always courteous and considerate—a character that will be sadly missed.—W. H.

Dr. ALFRED G. S. BROUGHTON, who had practised at Batley, Yorks, for 45 years, collapsed and died while playing golf at Howley on June 9. He was born in 1875, and after education at the Yorkshire College graduated M.B., Ch.B. of Victoria University in 1900. Dr. Broughton joined the honorary medical staff of the Batley and District Hospital in 1914 and was president 1938–41. He had been closely identified with ambulance work in the neighbourhood since 1907 and received the long service medal in 1924 as surgeon to the Dewsbury and District Corps; he was also a Commander of the Order of St. John of Jerusalem and a J.P. for the borough. He held office as chairman of the Dewsbury Division of the B.M.A. in 1922–3 and again in 1939–43, and had been president of the Yorkshire Branch. He was an enthusiastic musician and a pillar of the Batley Amateur Thespian Society, in whose orchestra he played for several years. His son, Dr. A. D. D. Broughton, also a past chairman of the Dewsbury Division, is serving as squadron leader in the R.A.F.V.R.

We regret to announce that Dr. ROBERT CRANNA, of Bolton, Lancs, died on June 12. He had been honorary secretary of the Bolton Division of the B.M.A. from 1923 and was elected chairman in 1939; he had also been a member of the Insurance Acts Committee for the past seven years. Born at Crimmond, Aberdeenshire, in 1876, he graduated M.B., Ch.B. at the University of Aberdeen in 1901 and four years later went to Bolton, where he built up a large practice and was a familiar and greatly respected personality. In 1923 he became honorary secretary of the Local Medical and Panel Committee and in 1935 was appointed its chairman and a member of the Bolton Insurance Committee. For the past four years he had been chairman of the local Medical Board responsible for passing men and women into the Services, and he was chairman and honorary secretary of several emergency committees dealing with practice in the borough. By the medical profession of Bolton and district the loss of Dr. Cranna will be sorely felt; they looked upon him as their counsellor and friend, and few can have given greater service to their fellow-practitioners or have been held in higher regard. He leaves a widow, a daughter, and three sons, two of whom are members of their father's profession, one being a major in the R.A.M.C.

Universities and Colleges

UNIVERSITY OF OXFORD

The Osler Memorial Medal for 1945 has been awarded to Prof. C. G. Douglas, D.M., F.R.S., Fellow of St. John's College.

At a Congregation on July 21 the degree of M.A., *honoris causa*, will be conferred on Col. L. M. Dyke, U.S. Army Medical Corps, officer-in-charge of the 91st General Hospital (Churchill Hospital).

On June 9 the degree of B.M. was conferred on D. F. van Zwanenberg in absence.

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

FINAL M.B.—*Part II (Principles and Practice of Physic, Pathology, and Pharmacology)*: D. G. Abrahams, D. A. Bailey, D. A. N. Barran, A. D. Beard, R. Bellamy, A. M. H. Bennett, J. G. Benstead, M. F. Bethell, P. F. Boreham, A. R. Buckley, A. R. C. Butson, R. E. Church, J. M. Cliff, N. K. Connolly, J. Crichton, D. E. Cullington, W. P. Dallas Ross, I. M. P. Dawson, J. A. R. Debenham, J. A. Dew, A. G. Dingley, A. C. Elithorn, A. M. Elliott, W. S. R. Fenton, J. F. Fisher, J. W. B. Forshaw, S. G. A. Forsyth, J. Gloster, R. A. Green, R. E. Gruchy, E. Halász, P. M. Jeavons, C. H. Kinder, J. B. Lawson, N. B. Malleson, H. R. Mallows, J. R. Moffat, J. P. D. Mounsey, G. R. E. Naylor, K. M. Nuttall, C. J. H. Paget, B. W. Pay, V. R. Pickles, D. A. Pyke, K. E. E. Read, J. W. T. Redfearn, J. A. Rycroft, D. N. Seaton, D. W. S. Sheldon, F. S. Sinker, J. C. Sloper, J. R. Smythies, R. E. B. Spencer, M. G. Thorne, A. J. Underwood Whitney, O. L. Wade, R. V. Walley, J. M. Walshe, W. Waugh, J. A. Waycott, E. J. M. Weaver, N. T. Welford, J. E. M. Whitehead, R. H. Whitworth, D. Wilkes, I. P. Williams, D. Wilson, R. B. Wilson, J. H. F. Wood, I. D. P. Wootton, S. P. Wrightson. *Women*: I. M. S. Chappel, P. J. Coope, C. E. Cooper, M. E. P. Hele, J. E. Keilin, M. M. Mason, L. A. Norris, H. M. Russell, C. N. Smith, J. Whitham, G. B. Wrong.

UNIVERSITY OF EDINBURGH

At a graduation ceremony, held on June 22, the honorary degree of LL.D. was conferred on Lieut.-Gen. Sir Alexander Hood, K.C.B., C.B.E., M.D., F.R.C.S.Ed., Director-General of Army Medical Services.

UNIVERSITY OF GLASGOW

At a graduation ceremony, held on June 26, the honorary degree of LL.D. was conferred on Major-Gen. Sir John Taylor, C.I.E., D.S.O., M.D., I.M.S. (ret.), late Director of the Central Research Institute, Kasauli.

The Harry Stewart Hutchison Prize for an essay on a subject connected with the health of children has been awarded to Marjory N. McFarlane, M.D.

UNIVERSITY OF ST. ANDREWS

At a graduation ceremony, held on June 29, the honorary degree of LL.D. was conferred on William Thomson Munro, M.D.St.And., F.R.C.P.Ed., late director of Glenlomond Sanatorium.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

His Majesty King Farouk of Egypt has sent a donation to the Restoration and Development Fund of the College. This gift is greatly appreciated by the Fellows and Members of the College as evidence of the importance which King Farouk attaches to the maintenance of close relationships between the Royal Medical Colleges of England and the Medical Faculty of the Egyptian University.

The Royal Egyptian Medical Association has sent a gift of £250, which, with the contributions from Egyptian Fellows of the Royal College of Surgeons, brings the contribution of medical colleagues in Egypt to over £1,000. This generous gesture is particularly valued, for the Royal Medical Colleges are very desirous of promoting good relations and cementing friendships between the members of the medical profession in our two countries.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

In the report of the annual general meeting of the College (June 16, p. 857) there was the following omission:

Re-elected to the Council:—*Representatives of the Fellows*: A. M. Claye, H. J. Malkin, C. A. G. Macafee. *Representative of the Members*: H. R. MacLennan.

SOCIETY OF APOTHECARIES OF LONDON

R. J. Mitchell, M.B., D.R.C.O.G., has satisfied the examiners at the examination for the diploma of Mastery of Midwifery.

The Services

Acting Surg. Cmdr. R. S. Rudland and Surg. Lieut.-Cmdr. J. C. Moor, R.N.V.R., have been awarded the R.N.V.R. Officers' Decoration.

Temp. Surg. Lieut. A. K. Mighton, R.C.N.V.R., has been appointed M.B.E. (Military Division) for bravery, determination, and great devotion to duty while serving in H.M.S. *Affleck*, when an explosion caused the whole of the ship to be penetrated by chlorsulphonic acid fumes. In spite of the appalling conditions the casualties were properly tended and the ship brought back to safety.

Major I. Mackenzie, R.A.M.C., has been appointed M.B.E. (Military Division) and Major (Temp.) G. E. Parker, R.A.M.C., has been awarded the D.S.O. in recognition of gallant and distinguished services in the field.

Major J. T. Macdougall, R.C.A.M.C., has been awarded the D.S.O., and Lieut. R. H. Jackson, R.A.M.C., the M.C., in recognition of gallant and distinguished services in Italy.

Capts. W. A. Lopez and L. P. De Souza, I.A.M.C., have been awarded the M.C. in recognition of gallant and distinguished services in Burma.

The following have been appointed to the Civil Consulting Staff of King Edward VII's Convalescent Home for Officers at Osborne, Isle of Wight: Sir Francis R. Fraser, M.D., F.R.C.P., Brig. W. Rowley Bristow, F.R.C.S., Sir Claude Frankau, C.B.E., D.S.O., M.S., F.R.C.S., Prof. J. Paterson Ross, M.S., F.R.C.S., Mr. G. T. Mullally, *M.C.*, M.S., F.R.C.S., Dr. F. M. R. Walshe, O.B.E., F.R.C.P., Brig. D. Evan Bedford, M.D., F.R.C.P., and Surg. Capt. W. D. W. Brooks, D.M., F.R.C.P., R.N.V.R.

The following appointments, awards, and mentions have been announced in recognition of gallant and distinguished services in Italy:

C.B.E. (Military Division).—Brigs. (Temp.) J. H. Bayley, M.C., J. G. Morgan, O.B.E., T.D.; Brig. (Acting) J. M. Mackenzie, O.B.E., M.C.; Brig. (local) F. A. R. Stammers, R.A.M.C.

O.B.E. (Military Division).—Lieut.-Col. R. L. Turner; Lieut.-Cols. (Temp.) T. M. R. Ahern, C. G. Baker, V. J. Downie, D.S.O., M.C., W. H. Gabb, W. Graham, J. H. Hutchison, and K. McNeill, R.A.M.C.; Col. (Temp.) R. L. Raymond and Lieut.-Col. (Temp.) W. H. A. Thorne, I.A.M.C.

M.B.E. (Military Division).—Majors (Temp.) F. W. Bunting, G. J. Cleland, H. G. Estcourt, T. E. Field, D. B. Jagger, B. J. Malley, J. Mason, J. M. McKiddie, R. L. Orchardson, D. L. Owen, and J. McL. Ross; Capts. R. J. A. Macdonald and J. B. Wyman, R.A.M.C.; Major (Temp.) A. K. Dutt, I.A.M.C.

D.S.O.—Lieut.-Cols. (Temp.) J. N. Groves and D. Wright, R.A.M.C.; Lieut.-Cols. (Acting) H. F. T. Macfetridge and N. A. A. Khan, I.A.M.C.

M.C.—Majors (Temp.) H. J. Minford and R. Waddell, Capt. G. Patton, and Lieut. W. S. Roderick, R.A.M.C.; Capts. S. Kesavulu, G. D. Koshal, and S. Mascarenhas, I.A.M.C.

Mentioned in Dispatches.—Lieut.-Cols. M. R. Elliott and E. C. Janes; Majors E. H. Anderson, D.S.O., R. W. Boyden, D.S.O., J. U. Coleman, J. A. Langille, and A. St. C. Rumball; Capt. (Acting Major) H. V. G. Latour; Capts. E. Aiello, R. J. Fassina, W. L. Menzies, J. Mitchell, H. L. Nutik, J. P. Pearce, H. M. Ross, and T. H. Smellie, R.C.A.M.C.

The following appointments, awards, and mentions have been announced in recognition of gallant and distinguished services in North-West Europe:

O.B.E. (Military Division).—Cols. (Temp.) S. O. Dolan, D. L. Kerr, T.D., M. A. Rea, and T. H. Sarsfield; Lieut.-Cols. (Temp.) W. J. M. Brandon, J. H. Dunn, T.D., M. de Lacey, T.D., A. McG. Michie, J. M. Scott, John Smith, and R. S. Taylor, T.D., R.A.M.C.

M.B.E. (Military Division).—Major (Temp.) J. MacP. Harker and Lieut. G. Ollerenshaw, R.A.M.C.

M.C.—Majors (Temp.) H. O. P. McSheehy, C. A. G. Cook, G.M., A. F. Wallace, and Gordon Williams; Capt. G. V. Cole, R.A.M.C.

Mentioned in Dispatches.—Col. G. E. Wight; Lieut.-Col. (Acting Col.) R. H. Cooper; Lieut.-Cols. C. D. S. Leef and D. F. W. Porter; Majors G. A. W. Currie and W. S. Keith; Capt. (Acting Major) J St. C. Moffat; Capts. H. H. Chase, M.M., N. Kaufman, A. H. Megill, A. L. Richardson, and R. W. Tisdale; Lieuts. J. J. H. Connors and B. G. Turnbull, R.C.A.M.C.

The following appointments, awards, and mentions have been announced in recognition of gallant and distinguished services in the Mediterranean theatre:

C.B.E. (Military Division).—Brig. (Temp.) R. A. Hepple, O.B.E., M.C., late R.A.M.C.

O.B.E. (Military Division).—Lieut.-Cols. (Temp.) S. A. MacKeith and A. H. Penman, R.A.M.C.

M.B.E. (Military Division).—Major (Temp.) B. P. R. Hartley and Capt. J. B. Brown, R.A.M.C.

M.C.—Major (Temp.) C. MacT. Hopkins, R.A.M.C.

Mentioned in Dispatches.—Brig. (Temp.) F. R. Sandford, C.B.E., M.C., T.D., Major (Temp.) A. E. Paxton, and Capt. J. P. Irwin, R.A.M.C.

The following appointments and awards have been announced in recognition of gallant and distinguished services in Burma:

C.B.E. (Military Division).—Brig. (Temp.) W. E. R. Dimond, C.I.E., O.B.E., I.M.S.

O.B.E. (Military Division).—Cols. (Temp.) F. K. Bush and R. V. Franklin; Lieut.-Cols. T. E. A. Carr, T.D., and H. R. Sheppard; Lieut.-Col. (Acting) M. MacR. Paterson; Lieut.-Cols. (Temp.) J. B. Bunting, J. B. M. Milne, M.B.E., and R. P. Smyth, R.A.M.C.; Col. (Temp.) F. R. Cawthorn, I.M.S.

M.B.E. (Military Division).—Capt. W. N. Calder, R.A.M.C.; Capts. C. K. Hassan, L. McA. Hogg, and S. S. Grewal, I.M.S.; Capt. (Temp.) M. M. K. Najam, I.A.M.C.

M.C.—Capts. J. A. Chamberlin, H. D. Cockburn, H. M. Jamison, M.B.E., and E. D. Kerr, R.A.M.C.; Capt. C. K. Rao, I.M.S.

CASUALTIES IN THE MEDICAL SERVICES

Died on active service.—Col. Basil Cedric Ashton, C.B.E., I.M.S.

Missing from Singapore since February, 1942, now reported to have died of dysentery as a prisoner of war in Rangoon on Aug. 31, 1942.—Major Hugh McPherson Kilgour, R.A.M.C.

DEATHS IN THE SERVICES

Lieut.-Col. JOHN CHARLES LAMONT, C.I.E., I.M.S., died on June 19 in Edinburgh at the ripe age of 80. He was educated at the Liverpool College and Edinburgh University, where he graduated M.B., C.M. in 1885 with first-class honours. In 1886–7 he was demonstrator of anatomy in the University, an appointment which determined his life's work. In 1887 he entered the Bengal Medical Service and saw active service with the Chin-Lushai Expedition of 1889–90 and the Munipur Expedition in 1891, receiving the Frontier medal with clasp. Three years later he was appointed professor of anatomy in the Punjab University at Lahore, a post that he occupied with distinction until 1906, when he went on leave preparatory to retiring in 1908 from the Indian Medical Service. He immediately took up the post of lecturer on anatomy, University College, Dundee, which he filled from 1906 to 1914, and for three years he was examiner in anatomy at the Royal College of Physicians of Edinburgh. He published a number of papers in the *Journal of Anatomy*, and was elected to F.R.S.Ed. in 1920. In 1914 he volunteered for military service, was re-employed by the Government of India, and was awarded the C.I.E. in 1919. His recreations were fishing and golf, and he was one of the five original members of council of the Clan Lamont Society, founded in 1895. His wife, a daughter of Stephen Adam, of Edinburgh, died in 1935, and in 1940, to commemorate her, he magnanimously gave his house at 7, Merchiston Park to the Corporation of Edinburgh, with the suggestion that it should eventually be used as a rest or convalescent home for their employees, though it has been used during the present war as an A.R.P. depot. Col. Lamont was a sound anatomist with wide interests and many friends and admirers. He had unbroken membership of the B.M.A. from January, 1888.

Medical Notes in Parliament

Diphtheria Statistics.—The following information was given by Mr. WILLINK in reply to questions on June 7: (1) According to returns received from all but a few local authorities in England and Wales the number of notifications of diphtheria during 1944 in children under 15 who had completed the course of immunization was 4,633, compared with 12,455 cases in non-immunized children. (2) Returns from local authorities in England and Wales, which do not include immunizations by doctors in private practice, show that during the year 1944 approximately 386,240 children under 5 and 175,080 between the ages of 5 and 15 were immunized against diphtheria. (3) 23,152 cases finally diagnosed as diphtheria were notified in England and Wales during 1944. Deaths from that disease registered in the same period are provisionally numbered at 934.

Tuberculous Persons in Prisons.—Sir DONALD SOMERVELL told Dr. Summerskill on June 7 that much attention had been given of recent years to prisoners suffering from tuberculosis. *X*-ray examinations were made in doubtful cases, and the prison medical officers received valuable help from the local tuberculosis officers. Care was taken to keep tuberculous prisoners whose condition was infectious apart from others. At prisons where there were several such prisoners special working parties were arranged. Where possible they were employed on light gardening work.

Ministry of Health Nursing Staff.—In the Ministry of Health nursing division the professional staff wholly engaged on nursing questions comprises one chief nursing officer, two deputy chief nursing officers, and 23 nursing officers, of whom three are permanent. In addition there are on the public health side 18 officers with nursing qualifications. The future complements are under discussion.

Vaccination and Death Certificates.—Mr. VIANT inquired on June 7 how many death certificates were received in the year 1944 in which vaccination, vaccinia, post-vaccinal encephalitis, generalized vaccinia, or any other symptom connected with vaccination was given as the cause or one of the causes of death. Mr. WILLINK replied that deaths of the type indicated which were registered in England and Wales during 1944 numbered 12. These were assigned as follows: vaccination 2, vaccinia 2, post-vaccinal encephalitis 4, generalized vaccinia 2, encephalitis myelitis 1. In addition vaccination was mentioned on the death certificate in the case of 1 death assigned to septicaemia.

Training of Midwives in Gas-and-air Analgesia.—In reply to Dr. Summerskill on June 7 Mr. WILLINK said that out of 188 local supervising authorities in England and Wales, 101 had made arrangements before Dec. 31, 1943, for the instruction of their midwives in the administration of analgesics in childbirth. The corresponding figure in the 1938 returns was 30, but there is reason to think that this was an understatement.

Notes in Brief

Mr. Butler states that miners partially disabled by silicosis or pneumoconiosis are eligible for the training and other facilities now provided to assist the resettlement of disabled persons. A number have secured satisfactory employment in this way. These cases will also be eligible for the further facilities to be provided under the Disabled Persons (Employment) Act which are in active preparation.

The Teviot Committee on Dentistry is proceeding with its inquiry as speedily as possible, but Mr. Willink cannot say when the final report will be presented.

The total number of experiments on animals performed during the year 1943 was 1,170,412, a large number of which were simple inoculations and similar proceedings performed either on behalf of official bodies with a view to preservation of the public health or directly for the diagnosis and treatment of disease in man or animals. Figures for 1944 are not yet issued.

The National Insurance (Industrial Injuries) Bill was introduced on June 12 and printed.

Mr. Harold Macmillan states that the release of students from the Services is under consideration.

In the ten-year period April, 1924, to March, 1934, 46,979 dwellings were erected by the L.C.C. For the ten-year period April, 1934, to March, 1943, the figure was 33,836, of which 30,189 houses were completed before new housing operations were suspended in September, 1939.

Payments made by the Exchequer for tuberculosis allowances during the year ended March 31, 1945, amounted to approximately £650,000.

The Trinidad Committee of Investigation on Local Medical Services has completed its survey. The committee's report has been published in Trinidad as a Legislative Council Paper. Copies should be available shortly at the Crown Agents for sale in the United Kingdom.

Medical News

A lecture on the war in the Pacific will be given by Brig. W. A. Hailes, C.B.E., D.S.O., Director of Surgery, Australian Military Forces, in the new lecture theatre, Radcliffe Infirmary, Oxford, at 5 p.m. on Friday, July 13.

The second annual conference to discuss the study of seminology is being held under the auspices of the Family Planning Association, at the School of Agriculture at Cambridge, on July 14 and 15.

A meeting of the Ross Institute Industrial Advisory Committee will be held at the Rubber Growers' Association, 19, Fenchurch Street, E.C., on Thursday, July 12, at 2.30 p.m., when Dr. G. Macdonald will speak on "Recent Developments in Tropical Hygiene." A discussion will follow.

A meeting of the Medico-Legal Society will be held at 26, Portland Place, W., on Thursday, July 19 (immediately after the annual general meeting at 5 p.m.), when the president, Mr. Roland Burrows, K.C., will give an address on "Some Thoughts on Crime."

Prof. A. V. Hill, Sc.D., Senior Secretary of the Royal Society, left England on June 26 for Copenhagen to convey the greetings of the society, as representing the men of science of Great Britain, to their Danish colleagues, and through the Academy of Sciences in that country to discuss with them what aid British science can give to the rehabilitation of science and scientific education in Denmark. After three days in Copenhagen Prof. Hill went to Oslo for the same purpose and was received at an extraordinary meeting of the Norwegian Academy of Sciences.

A Standing Advisory Committee on Artificial Limbs has been appointed by the Minister of Pensions under the chairmanship of Sir Charles Darwin, F.R.S. The other members are: Dr. A. W. J. Craft, Lieut.-Col. A. L. Eyre-Brook, F.R.C.S., Mr. E. Ramsay Green, Prof. T. P. McMurray, F.R.C.S.Ed., Mr. L. P. B. Merriam, Mr. George Perkins, F.R.C.S., and Sir A. Rowland Smith. The secretary to the committee will be Mr. K. S. Watt.

Raymond Lewthwaite, D.M., Field Director, and Kenneth Mellanby, Sc.D., Experimental Biologist, Typhus Research Commission, have been appointed O.B.E. (Civil Division) for services to the Forces in India.

A. L. Banks, M.D., M.R.C.P. (Lincoln's Inn), and M. MacGregor, M.D. (Middle Temple), were called to the Bar on June 13.

At the June meeting of the Council of the Royal Sanitary Institute, Mr. David M. Watson, B.Sc., M.Inst.C.E., was elected chairman to take office on Oct. 1, 1945.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* notifications of whooping-cough rose by 97 cases, of dysentery by 38, and of diphtheria by 15; there were 573 fewer notifications of measles, and 95 of scarlet fever.

There were only small changes in the local trends of scarlet fever: Essex reported 20 fewer cases than last week. Lancashire reported 20 more cases of diphtheria, Essex 11, and Durham 10. Yorks West Riding had 156 fewer notifications of measles, and Kent 153; the largest rise was 112 in Berkshire.

A large outbreak of dysentery, involving 113 persons, was reported from Worcestershire, Malvern U.D. The other large returns were London 49, Lancashire 44, Buckinghamshire 43, Middlesex 27, Surrey 26, Northumberland 24, Warwickshire 15, Devonshire 14, Berkshire 11, Southampton 10.

In *Scotland* dysentery notifications fell by 42—making the total half that of a fortnight ago, and the lowest since the beginning of January. The notifications of diphtheria increased by 10; Glasgow had 11 more cases than last week.

In *Eire* measles notifications rose by 30, and whooping-cough by 26, but those for diphtheria fell by 9. The largest returns for measles were Dublin C.B. 30, and Wexford, Wexford U.D., 13, and for whooping-cough Dublin C.B. 25, and Wexford, Gorey R.D., 12.

In *Northern Ireland* the incidence of diphtheria increased by 7, and of scarlet fever by 10, while whooping-cough fell by 12.

Plague in Malta

The diagnosis of 4 cases of bubonic plague in Malta has been confirmed.

Week Ending June 23

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,237, whooping-cough 1,117, diphtheria 422, measles 6,626, acute pneumonia 376, cerebrospinal fever 46, dysentery 287, paratyphoid 4, typhoid 7.

No. 24

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 16.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945 (a)	(b)	(c)	(d)	(e)	1944 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	47	6	29	2	2	58	4	29	2	—
Deaths		1	—				—	1		
Diphtheria	438	25	113	69	17	456	23	111	82	20
Deaths	5	—	2	—	—	6	1	—	—	—
Dysentery	464	49	77	2	—	191	28	63	3	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	—	—	—	—	—	—	—	—	3	—
Deaths		1					—			
Erysipelas			47	11	1		—	44	8	3
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				34					17	
Deaths	45	4	8	6	3	43	10	12	10	3
Measles*	7,890	412	351	70	9	2,623	199	429	134	43
Deaths	4	—	1	—	—	—	—	3	—	—
Ophthalmia neonatorum	57	6	27	—	—	63	9	24	—	—
Deaths										
Paratyphoid fever	1	—	1 (B)	—	—	5	—	—	2 (B)	—
Deaths	—	—	1	—	—	—	—	—	—	—
Pneumonia, influenzal†	389	20	16	1	4	490	40	3	6	3
Deaths (from influenza)	14	2	—	—	2	6	1	—	—	—
Pneumonia, primary			194	18				199	19	7
Deaths		23		8	9		23		3	
Polio-encephalitis, acute	1	—				2	—			
Deaths		—					—			
Poliomyelitis, acute	6	—	2	1	2	11	—	1	—	—
Deaths		—					—			
Puerperal fever		1	15		1		4	18		—
Deaths										
Puerperal pyrexia‡	129	8	17	4	—	167	15	15	4	3
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,314	65	201	18	44	1,544	86	212	28	65
Deaths	—	—	—	—	—	2	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	5	—	2	2	—	8	—	2	6	—
Deaths	—	—	—	—	—	1	—	—	—	—
Typhus fever	1	1	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,130	48	97	54	8	2,628	250	197	64	17
Deaths	4	1	2	1	1	15	1	2	3	—
Deaths (0–1 year)	305	34	55	19	22	315	40	57	22	16
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,901	573	548	189	117	3,943	622	587	176	112
Annual death rate (per 1,000 persons living)			12·4	12·2	§			13·5	11·4	§
Live births	6,895	811	928	410	257	7,525	864	906	407	298
Annual rate per 1,000 persons living			18·6	26·5	§			18·4	—	§
Stillbirths	238	30	42			228	27	39		
Rate per 1,000 total births (including stillborn)			43					41		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to movements of population, birth and death rates for Northern Ireland are still not available.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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ANY QUESTIONS?

Industrial Dermatitis

Q.—*A patient weighs out and mixes arsenic powder in an atmosphere of alkali powder and cobalt powder. He has a rash on his face. What should be done to prevent this? Would a cream be of any use?*

A.—There are worse things than a rash on the face, and the materials used and the circumstances suggested make it seem that fume-cupboard conditions are advisable. The rash on the face may be caused (or aggravated) by the exposure described; on the other hand, it might be unconnected with the work. A dermatologist's opinion would seem desirable. Barrier preparations are not, of course, intended for the treatment of skin conditions, and some types are definitely unsuitable for application to an inflamed skin. For prophylaxis, reduction to a minimum of exposure to the powdered ingredients and scrupulous cleanliness would be preferable to barrier creams.

Survival of Tubercle Bacilli

Q.—*Is a country house, with its own water supply and sanitary arrangements, which up to 2 years ago was occupied by a man aged 30 who died from pulmonary tuberculosis, fit to be taken by people with a young child? They are afraid the child might contract tuberculosis from the dust, etc., of this house. Fumigation was done by the public health authorities 2 years ago, and it has since been occupied by people with no children. How long can tubercle bacilli live in dust and dark rooms?*

A.—There should be no risk of infection from the tubercle bacillus in a house which was last occupied by a patient two years ago. There are few records of the survival of the tubercle bacillus outside the animal body for longer than two or three months. Under the most favourable conditions as regards darkness and moisture to which the bacillus is ordinarily exposed, the longest recorded period of survival is about six months, and this appears to be exceptional.

Premature Systoles

Q.—*What treatment would you advise for premature systoles? Causal factor unknown. Tobacco eliminated. Bromides have been tried.*

A.—Sepsis—oral, nasal, urinary, and genital—must be considered; also excess of tea or coffee and disturbances of gastric or gall-bladder origin. But unless the premature systoles worry the patient, treatment of them is really superfluous. Quinidine, or quinine, sometimes may abolish them, or small doses of phenobarbitone. Some authorities have found that a grain or so of digitalis leaf daily is effective. Last and not least is the careful consideration of the patient's general health. A run-down condition, overwork, overstrain, and worry may all play a part in the causation of premature systoles.

Acupuncture

Q.—*What exactly is acupuncture? Is treatment by this method ever used to-day? I once read in an old medical journal that Sir James Simpson, who thought he had discovered this treatment and obtained such wonderful results from it, believed that after his death he would be remembered more for acupuncture than for chloroform.*

A.—A brief note in Comroe's *Arthritis* mentions that acupuncture was first described about A.D. 300 in a treatise by Huang Fu. If it had been of any real value it would hardly have been lost sight of and rediscovered from time to time. It is probably simply a form of counter-irritation akin to the seton fashionable in pre-antiseptic days. Puncture with a needle conveying an electric current is sometimes advised as a method of detecting the tender trigger points in fibrositis, but otherwise the only modern method of this kind is injection of analgesic substances such as procaine into tender areas in fibrositis and traumatic conditions such as strains.

Synovitis and Synovectomy

Q.—*A male aged 30 has during the past year had several attacks of synovitis of the left knee-joint. There was no definite history of trauma, but he thought that the swelling first appeared a few days after a strenuous game of squash. After periods of splinting and firm bandaging the fluid diminished, only to recur within a few days of support being removed. Never any pain or tenderness, no limitation of movement apart from that consequent upon the presence of fluid. X-ray examination shows no abnormality, and no constitutional cause is discoverable. He has been advised to have an operation for synovectomy. What are the results of this operation, particularly with regard to range of movement usually obtained post-operatively?*

A.—Without clinical examination it is not permissible to give a diagnosis on the evidence available. On the face of it synovectomy appears to us a rather heroic measure in the circumstances as described. Synovectomy is an operation the indications for which have not clearly been laid down as yet. Two conditions of the knee-joint in particular do call for it: (*a*) chronic villous arthritis which has not responded to other measures; (*b*) synovial osteochondromatosis. In rheumatoid arthritis, where the changes are predominantly of synovial type with more or less hydrops which does not respond to conservative measures, we have another possible indication. For rheumatoid and osteo-arthritis of the ordinary types the procedure is, however, still in the experimental stage. Very few series of cases have been described, yet the present writer is convinced of the value of the procedure in well-selected examples. The ease with which movement is restored is sometimes quite remarkable, and obviously there must be considerable powers of regeneration.

The question often brought up is whether the patella should be excised. There may be an indication for this, more especially in osteo-arthritis, but one feels that to do it at the same time as synovectomy very much complicates the after-treatment. The repair of the quadriceps after patellectomy adds difficulty when one wishes to begin early movements for the synovectomy. One's impression is that synovectomy improves the whole arthritic process probably by improving vascularity. After synovectomy one expects to obtain flexion of the knee-joint at least to a right-angle, which is sufficient for ordinary use.

Treatment of Hirsutism

Q.—*Is short-wave diathermy a practicable method of treatment for hirsutism? If so, how is it carried out and with what results? I have heard of long-wave diathermy being used (as surgical diathermy). Electrolysis seems the best method.*

A.—In short-wave diathermy the electrodes must be placed some centimetres distant from the skin to avoid a burn, which would result from direct contact. It follows that as the heating effect is diffused over a varying area, treatment of this kind can have no application in the removal of superfluous hair.

Long-wave diathermy is used to remove superfluous hair, but it is open to question whether the results are superior to the old-fashioned constant-current battery, with needle attached to the *negative* pole. Scarring cannot be avoided, nor does electrolysis prevent growth of new coarse hair. Nevertheless, the patient feels and sees that something is being done. Removal with wax, as carried out in reputable establishments, gives a good temporary depilation. Only rarely can patients be persuaded to shave, although this is by far the best procedure. On no account should *x*-ray treatment be countenanced.

Removing Buried Tonsils

Q.—*In tonsillectomy by dissection, in the case of buried and very adherent tonsils, under general anaesthesia, is it safe to infiltrate the capsule by injecting a weak solution of novocain with adrenaline in order to facilitate removal?*

A.—It is quite safe unless chloroform is being administered. Incidentally, saline and weak adrenaline is as efficacious as novocain and adrenaline in reducing haemorrhage. It is, however, doubtful if any infiltration will be of much assistance.

Vulval and Pubic Boils

Q.—*A woman patient aged 57 is troubled with recurrent boils affecting chiefly the vulval and pubic regions. Can you suggest the treatment? The urine contains neither sugar nor albumin.*

A.—The treatment of boils affecting the vulval and pubic regions does not differ materially from that of boils occurring in other moist situations. If all the usual methods of treatment have been tried without success the use of penicillin is recommended. This should be applied as a spray, a solution containing 1,000 Oxford units per c.cm. being most likely to be effective; if a fine spray is used very small quantities are required. Needless to say it should be determined first whether the infecting organism is penicillin-sensitive. If penicillin is not available, local applications of sulphonamide powder or cream may be tried, but should not be used for more than a few days for fear of sensitizing the patient.

Allergy to Alkaloids

Q.—*A pharmaceutical chemist suffers from asthmatic attacks when engaged on preparation of hypodermic tablets of morphine, atropine, and heroin. Patch tests and intradermal injections of minute quantities of these drugs produce large wheals. Do alkaloids cause the attacks, or can they be attributed to an excipient? Should these drugs be avoided in a future illness?*

A.—Dermatitis has been described from contact with opium and belladonna and their alkaloids, and rashes sometimes occur after ingestion of these drugs. It is therefore probable that the asthma in this patient is the result of inhalation of the powdered alkaloids. The mechanism in these and other drug allergies is a combination of the drug with body protein to form an allergen to which the individual becomes sensitized, and it is therefore probable that an allergic reaction would occur if the drugs were given by mouth or parenterally. It is also probable that the patient would react unfavourably to any of the opium or belladonna alkaloids. It would nevertheless be desirable to carry out tests with the excipient to exclude the possibility that this is the harmful substance. Patients can often be desensitized to drugs to which they are sensitive, but this may not be practicable here owing to the pharmacological actions of the alkaloids.

Treatment of Menopausal Flushes

Q.—*A woman aged 42 is very inconvenienced by hot flushes, which began 18 months ago when menstrual periods became irregular. They were completely cured by hexoestrol 2 mg. daily, and periods started again and were normal for a few months. Periods ceased again (hexoestrol had been reduced) and flushes became marked. Hexoestrol 3 mg. given daily. Flushes better and had normal period, but flushes started intensely during this period and have continued since. She is a stable type, not neurotic, but the flushes are unpleasant and tiring. Her weight is 12 st. 4 lb., slightly increasing. Suggestions for treatment would be welcomed.*

A.—The fact that the flushes initially responded to oestrogen is suggestive that they are a climacteric manifestation. That they no longer respond is probably because the dose employed has been heavy and the treatment prolonged, so the patient has become resistant to it. This being the case, oestrogen therapy should be abandoned—at any rate for the time being—and instead thyroid should be tried, beginning with 1 gr. daily and gradually increasing the dose, short of producing toxic symptoms. Calcium in large doses (45 gr. daily), and synthetic vitamin E (3 mg. b.i.d.) might also be helpful. Although the woman is of stable type, general measures, sedatives, reassurance, and protection from nervous and physical strain remain important in treatment. An attempt to reduce the patient's weight by dieting should also be made.

If after 4 to 6 months the flushes remain troublesome, oestrogen therapy might be tried again, but the dose should be much smaller —insufficient to produce further uterine bleeding, and just sufficient to reduce the number of flushes and not to abolish them. Oestrone, or one of its esters, 0.1 to 0.3 mg. t.d.s. by mouth, should be adequate, and after 2 or 3 weeks' treatment at this level the dose should be *gradually* reduced week by week, and discontinued within 2 to 3 months.

Adder-bites

Q.—*In certain parts of the Scottish Highlands during the summer numerous adders are to be found, and occasionally adder-bites give rise to serious emergencies. What is the up-to-date treatment of the condition, "first-aid" and "long-term"? Is antivenom readily obtainable? Is it stable, and will it keep "in stock"?*

A.—The only poisonous snake in Great Britain is the adder or common viper (*V. berus*), which is more frequently met with in the northern parts of the island. Though the venom is poisonous its bite is not very dangerous to adults, yet with children there is more serious danger. A fatal result is rare. The venom of the viper contains haemorrhagin—a proteolytic poison which causes great local swelling and may lead to intravascular coagulation if the poison gets into the blood stream. There is also a small proportion of a toxin which affects the nervous system. The symptoms which result from the bite come on within a few minutes, and consist of swelling round the bitten part, and later collapse and peripheral circulatory failure if the venom enters the general circulation.

The immediate treatment is to prevent the poison getting into the general vascular system. This is achieved by the immediate application of a tourniquet tied on the limb (generally the leg) proximal to the bite. The tourniquet must not be left on for more than half an hour without temporary relaxation. Meanwhile an incision should be made at the bitten area and an attempt made to suck out the poison. Preferably this should be done by mechanical means, but it may be necessary to use the mouth when nothing else is at hand. Some authorities state that the injection of a few cubic centimetres of a 1% solution of potassium permanganate into and around the wound will destroy all the poison not yet absorbed. If general symptoms supervene restorative measures must be adopted—e.g., warmth, the administration of fluids (tea and coffee) by the mouth, and in extreme cases blood transfusion. The administration of strychnine and morphine is forbidden, for these drugs make matters worse; nor should alcohol be given if an antiserum is to be administered.

Antivenom is not readily obtainable in this country, for it is not made in any of our laboratories. It can be obtained from India, from at least one place on the Continent, and from America. Since the serum is sufficiently stable and will keep for a year or more it could be kept in stock. When available the serum is injected into the subcutaneous tissue of the lateral abdominal wall. Doses of 10, 20, or 30 c.cm. may be necessary.

Action of D.D.T.

Q.—*In what way does D.D.T. prove lethal to pediculi, flies, cockroaches, etc.?*

A.—D.D.T. is a contact poison: that is to say, contact with the dry powder or with drops of a solution of D.D.T. is fatal to most types of insect. The lethal dose is much lower than that of any of the usual synthetic insecticides. Its action is rather slow, so that an affected insect may not die for several hours, but in the meantime it will exhibit characteristic symptoms (continuous uncoordinated movement). The speed of kill varies with different insects: the susceptible mosquitoes and flies are usually killed in a matter of minutes, pediculi live for several hours, while bugs and roaches, which are rather resistant, may survive a day or two after contact.

Renal Glycosuria

Q.—*A young man of about 25 suffers from intermittent glycosuria. A glucose-tolerance test done with 50 g. glucose orally gave the following result: blood sugar before glucose 100 mg. per 100 c.cm.; 1/2 an hour after glucose, 120 mg.; 1 hour after glucose, 110 mg.; 1½ hours after glucose, 100 mg.; 2 hours after glucose, 80 mg. The corresponding urine sugar values were nil, trace, 0.2%, 0.1%, nil. No acetone bodies were detected in the urine. Does this condition require treatment? If not, is it a disqualification for Government service, civil or military? Will he be accepted by life insurance companies as a first-class life?*

A.—The sugar tolerance is normal in this patient, since the fasting value of the blood sugar is 100 mg. per 100 c.cm. blood, and after 50 grammes of glucose the blood sugar does not rise above 120 mg. per 100 c.cm. and has returned to 80 mg. after two hours. The top level of the blood-sugar curve, if it is venous blood, should not exceed 150 mg., and if it is capillary blood 180 mg. The presence of glycosuria shows that the threshold of the kidney is set at a level which is considerably lower than the normal, and is probably about 100 mg. per 100 c.cm. blood. This condition of renal glycosuria does not require any treatment at all. It should not be a disqualification for civil or military service, though it is possible that the military authorities might regard it with suspicion. These patients are accepted by most of the life insurance companies as first-class lives.

The Anamnestic Reaction

Q.—*What is the anamnestic reaction, and what is its significance?*

A.—The anamnestic reaction is the reappearance in the blood of an antibody produced in response to previous infection on inoculation, or an increase in its quantity, consequent on some other stimulus. A commonly observed example is an increase in titre of agglutinin for a member of the enteric group during the course of another possibly quite unrelated infection. This complicates the diagnosis of enteric fever by means of the agglutination test in persons who have had T.A.B. vaccine. Fortunately, the anamnestic reaction involves H (flagellar) agglutinins only; a rising O agglutinin titre is therefore significant of actual infection.

How is Milk Dried?

Q.—*I understand that there are different processes for drying milk. What are these processes? How do they affect the chemical or physical constitution of the reconstituted milk? Can you say which methods are used by well-known makers? What is National Dried Milk, and by whom is it made?*

A.—The processes in general use for the drying of milk are of two types: the roller (drum or film) processes, and the spray (or atomizer) processes. In the roller processes the milk is distributed as a film on the surface of revolving metal rollers, or drums, which are heated internally by steam. The film of milk dries to form an extremely thin solid sheet which is removed from the rollers by a stationary knife-edged scraper and sieved to a powder of the desired fineness of grain. In some roller processes the milk is precondensed in a vacuum-pan or continuous-flow evaporator before application to the rollers. The rollers may work singly or in pairs; in the latter case the milk is fed into the trough between two closely set rollers rotating towards each other. Roller-drying systems may be divided into two classes: those working at atmospheric pressure

at high temperatures, and those working *in vacuo* at lower temperatures. In the spray processes the milk, usually pre-condensed to several times its initial solids content, is reduced to an exceedingly fine spray or mist in the presence of a current of heated air. The minute droplets of liquid expose a very large surface to the hot air, and evaporation of their moisture is virtually instantaneous. The droplets become small particles of powder which fall to the bottom of the drying chamber. There are various methods of obtaining the necessary fine spray, and various designs of drying chamber.

As a result of their different methods of manufacture, the roller- and spray-dried milk powders differ in their physical structure in the dry state and in their properties on reconstitution. Particles of roller powder are solid and granular and of irregular shape (mainly in the form of thin flakes); they are usually ground to pass a sieve of 0.02 in. mesh. In the whole-milk product the fat is present in relatively large masses, which when the powder is reconstituted rapidly run together and rise to form an upper layer. Particles of spray powder are spherical with an enclosed air bubble, and usually about 0.002 in. in diameter. They are individually light and fluffy, but in the bulk pack more closely than the roller type. The fat is present as very small globules, which remain dispersed on reconstitution.

The two types of powder differ markedly in "solubility"—that is, in the extent to which, when mixed with the appropriate quantity of water, they simulate the characteristics of fresh milk by the individual constituents resuming their natural states of true or colloidal solution or emulsion. In roller-drying at atmospheric pressure the film of milk reaches a high temperature and dries fairly slowly. Solubility is impaired, and is usually about 75 to 85% in cold water and 80 to 95% in hot water. In spray-drying the extremely rapid evaporation maintains the temperature of the milk particles at a very low figure, and good spray powders are practically completely soluble in cold water. Roller-drying *in vacuo* yields a powder approaching the spray type in solubility, but is apparently not carried out in this country. The insoluble matter of the powders is largely protein, with a little mineral matter. Subjection of the milk to high temperatures causes denaturation of the casein and soluble proteins, and these flocculate and lose their power of fine colloidal dispersion. The digestibility of both types of powder is very high; reconstituted roller powder yields a softer curd than fresh milk or reconstituted unmodified spray powder.

Spray-dried and high-quality roller-dried milk powder retain, on reconstitution, the nutritive value of the original raw milk to a remarkable extent, but the processing does cause some loss. Spray-dried milk loses about 20% of its vitamin C and 10% of its vitamin B_1. The biological value of its protein is reduced by not more than 5%. High-quality roller-dried milk loses about 30% of its vitamin C and 15% of its vitamin B_1; the deterioration of the proteins is greater than in the spray type. The availability of the other constituents—including vitamin A, vitamin D, riboflavin, carotene, and the minerals—is not significantly affected by either process.

Most of the milk-powder made by our well-known firms is roller-dried. It is cheaper to produce, and under ordinary packaging and storage conditions roller-dried powders containing fat—that is, the full-cream and part-cream milk powders—keep in a palatable condition longer than the corresponding spray-dried products. Recent developments in the production and storage of spray-dried whole-milk powder of long-keeping quality may, however, encourage its manufacture.

National dried milk is roller-dried in two varieties—a straight full-cream powder, with no addition, having the usual fat content of 26 to 27%; and a "half-cream" powder with a fat content of 16.5%. It is made, under official wartime enactment, by various firms in this country.

INCOME TAX

Partner Acquires Whole Practice

V. acquired the other partner's share in the practice, including the former partner's house. Can V. now claim to deduct for income-tax purposes (*a*) the cost of removal to the newly acquired premises, (*b*) the £31 paid to his former landlord for dilapidations, and (*c*) the payments made for the furniture and fittings taken over from the former partner?

*** The matter is not free from doubt, the expenses being in the main a matter between the partners rather than between the practice and the outside world. On the whole, however, and assuming that for, say, the first year under the new arrangement the practice is carried on as a "sole" practice, our opinion is: (*a*) and (*b*) These expenses can be deducted in so far as they relate to the professional as distinct from the private purposes; some reasonable proportion should be claimed. (*c*) Yes, but subject to two limitations. First, the amounts received for the corresponding fixtures, etc., sold from the former premises must be deducted from the total cost; and, secondly, a further deduction must be made in respect of any improvement secured by the transaction—improvement, being a "capital" affair, does not carry an income-tax claim to deduction.

LETTERS, NOTES, ETC.

Treatment of Intractable Eczema

Dr. P. KIRWAN (Northampton) writes: Your readers may be interested in this account of a cure of a particularly intractable case of infantile eczema. The case was one of about 5 months' standing in a female child of 2. The child had attended at hospital, and various treatments had been given, but all to no avail. When first seen by me the condition had spread all over the face and neck and was patchy on the scalp. It had reached the encrusted and weeping stage with many follicular pustules and bilateral blepharitis. The child was in great distress and had, naturally, been scratching. The treatment was as follows: To prevent scratching the arms were covered in cotton-wool and encased in stiff corrugated cardboard. Strict instructions were given that no soap or water be used for cleaning the affected parts. The crusts and scales were removed by applying a starch poultice, and the following ointment was applied twice daily:

Hydrarg. ammon.	gr. x
Liq. picis carb.	ʒj
Liq. plumbi subacetatis	ʒss
Vaselini	ʒij
Adipis lanae hydrosi	ad ʒj

Combined with this, a mixture was prescribed containing arsenic, 3 minims to the teaspoonful dose t.i.d. Tabs. "adalin" 1 nightly were given to ensure sleep. Frequent visits were made to see that instructions were being carried out, and it is satisfactory to record that this long-standing condition was completely cleared up in 3 weeks.

Physiology and Psychology of Craving

Dr. H. C. BROADHURST (Hounslow) writes: Your psychologist, in answer to a query on this subject (June 2, p. 793), states that when the body has need of some particular food, it feels the need for it although it has no knowledge of what it needs. He instances the hypoglycaemic child who craves for sugar. But what child does *not* crave for sugar? And does the rachitic child crave cod-liver oil or the anaemic child spinach or liver? Obviously not. Hunger is instinctive, but while we naturally prefer a mixed and tasty diet to one which is monotonous and unpalatable, we have not in fact an instinctive liking for the right *kind* of food. Hence the need for education in this matter. I doubt if piglets rush to eat earth because they need the iron in it. Rats deprived of vitamin B possess no instinct which prompts them to select food containing this vitamin when a variety of foods is offered to them. It is true that after experience rats will choose the appropriate food, but this is the result of education and not of instinct.

Sterilizing Needles, etc.

Dr. W. F. COOPER (Kingston-on-Thames) writes: You describe sterilization of needles. I find that few men know of the tip that urea melts at 132° C.; so that needles (I also sterilize gauze, etc., in small tins) can be wrapped in paper, put in the oven near some urea, and heated until the urea melts, then the oven allowed to cool. Another useful tip is that paper starts to go brown, singes, at about 150° C. Sugar starts to become caramel at about that temperature, so a dodge is to add a crystal to oil in a spoon and heat over a flame until the sugar goes brown. Amyl alcohol is not nice stuff, but it boils at about 130° C. and can be washed out by alcohol and then water. Hexamine tablets burn with a smokeless flame and are useful to carry in one's case. You do not mention the tip of running a needle into a cork, at the correct angle, and rubbing down both cork and needle. One should use a fine stone, not carborundum.

Apparatus for Caudal Analgesia

Mr. J. H. PEEL and Dr. A. H. GALLEY, whose letter appeared on June 9 (p. 821), write to say that they are very short of apparatus for caudal analgesia, and it has come to their notice that numbers of complete outfits are arriving in this country and are included in American Red Cross parcels. They ask any practitioners who come into possession of these outfits to forward them if not wanted by themselves. "Either 86, Harley Street, London, W.1, or King's College Hospital, London, S.E.5, would find us, and we would be very willing to refund postage; as you know, Red Cross material must not be sold."

Journals and Books for Italy

Major W. MACKENZIE, R.A.M.C., writes to say that there is a great need in Italy for British medical publications of any kind. If any reader has periodicals or books to spare, and would address them to Major MacKenzie, c/o the *British Medical Journal*, we would forward them to him for distribution.